THE IRON AGE

THURSDAY, OCTOBER 29, 1891.

The New Pennsylvania Oil Field.

The great oil region recently opened in the McDonald field has now reached an aggregate production of 52,000 barrels daily, and all energies are taxed to provide tankage and other facilities for handling this tremendous output. Referring to the principal operators the Pittsburgh *Dispatch* says:

With a gang of about 300 men, they have laid in the aggregate 70 miles of pipe throughout the field. They now have three large stations in operation. The first, in the town of McDonald, has a capacity of 6000 barrels a day; the second, at Willow Grove, half a mile northeast of McDonald, has a capacity of 30,000 barrels a day; and the last, at Gregg Station, a mile northeast of Oakdale, can pump away 30,000 barrels a day. They have completed three iron tanks at Gregg Station, and altogether have finished and in course of construction tankage for over 500,000 barrels of oil. The main stations pump the oil into the large storage tanks and to the trunk lines. There are three stations termed local stations, which send the oil to the main stations. One of these is on the Herron farm back of Noblestown and below the Matthews well, and has 30,000 barrels a day capacity. The second is on the Robinson farm, near Elliott No. 1, with a capacity of 10,000 barrels a day, and they are completing one with a capacity of 8000 barrels a day on the Baldwin farm, below Baldwin No. 1. They have in use from 40 to 50 small duplex pumps scattered throughout the field to take the oil from the wells to the local stations. There are 16 pumps at the main stations, each of which can pump away from 200 to over 1000 barrels an hour. The steam to run these pumps is generated in 16 boilers of 35 horse-power each and 19 of 25 horse-power each. Four stationary boilers of 80 horse-power each are now being put up at Gregg station. The same size battery is also being set up at McDonald. There are at present one 6-inch line and three 4-inch lines running from the field to the main lines, and another 4-inch line will be completed in a very short time.

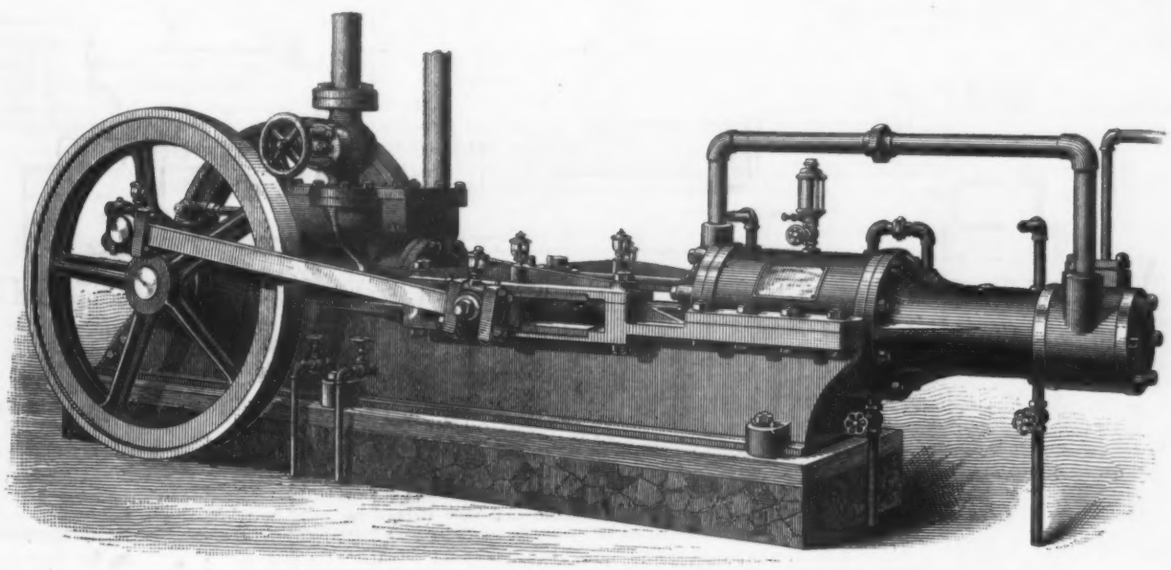
The Pittsburgh *Times* says: "Although the McDonald field is very young, in fact not over 10 months old, it has produced over 2,500,000 barrels of oil, representing at the current price of oil a value of about $2,000,000. Much oil has been spilled on the ground on account of the inability of the lines to handle it. It is estimated that over 100,000 barrels have been lost within the past 10 weeks in this way."

Different opinions prevail in the East and the West respecting the use of iron and tin in shutters designed as a protection against fire. Secretary Charles R. Peck of a company in Philadelphia, after reviewing a discussion between Mr Atkinson and others, says: "Experience has shown that the best protection for openings and windows is a door or shutter about 2 inches thick, made of 1 inch matched boards, covered on all sides and edges with best quality tin, laid on in lock joints. No soldering to be used, but nails to be driven under the fold. This, in brief, without going into further detail, is substantially the only kind of door or shutter approved in the East, and should speedily be adopted throughout the country. Tin, for very many reasons, being far superior to sheet iron." As a matter of fact tin and sheet iron are practically the same, assuming that their thickness is equal, tin having the single advantage that it is anti-corrosive. Galvanized sheet iron, it would be safe to affirm, is most desirable for the purpose specified.

In the year 1887, at the commencement of gold exploitation in South Africa, the total production only reached 34,097 ounces; in 1888, 230,640 ounces were raised; in 1889, 377,740 ounces, and in 1890, 494,756 ounces; while the output for the first nine months of 1891 points to a total of 502,715 ounces. There is yet to be added the production of the De Kaap district—namely, over 35,000 ounces in the first half of the present year, the output for July alone amounting to 7632 ounces. The total production of the Transvaal gold mines for 1891 will probably reach 780,000 ounces.

Compound High Pressure Air Compressor.

The compound high-pressure air compressor here illustrated is designed for compressing air or gas from 100 to 5000 pounds per square inch. The air is admitted to the large cylinder through the piston, is compressed to about one-eighth the required pressure, and on the return stroke the pressure is raised to the point required. Though single acting, the capacity of one of these compressors is about equal to that of the double-acting machine of the same cost of construction. The initial air cylinder is made large enough to correspond with the capacity of the smaller high-pressure cylinder. The strains are equalized, because the area of the large cylinder multiplied by its low pressure is exactly equal to that of the small cylinder multiplied by its high pressure. The maximum strains are reduced considerably below those which exist in compressors that do not compound the air.



THE INGERSOLL-SERGEANT COMPOUND AIR COMPRESSOR FOR HIGH PRESSURES.

The advantage of the single-acting air cylinder over the double is that it compresses a volume of free air only once every revolution, hence there is a better chance to cool the air during compression. The cylinders have time to impart to the water jackets the heat produced by compression and are kept cooler. Single-acting cylinders offer a better chance to keep the packing tight, thus there is less leaking—an important point in dealing with high-pressure air. The large air head of the initial cylinder is jacketed, also adding to isothermal economy.

Economical results are attained with this compressor at low cost of construction. The fly wheels are small, and the bearings narrow, because the maximum strain is less, and the momentum of the piston and other moving parts is such that most of the high initial steam power is taken up in starting these parts and is afterward given out at the end of the stroke, when the steam pressure is low. The strains are direct, and expensive foundations are not required.

The operation of the machine will be readily understood from the longitudinal

section, Fig. 2. Air enters the large cylinder through the air inlets A, and passes through the annular valve B formed in the low-pressure piston C. On the return stroke, toward the left, the air in the cylinder is compressed and forced through the discharge valve D into the connecting pipe E between the low and high pressure cylinders. It enters the high-pressure cylinder through the inlet valve G, and is discharged through the valve K. The cylinders are cooled by the water jackets J. The circulation of air during compression is indicated by the arrows within the cylinders and pipe. This compressor is built by the Ingersoll-Sergeant Drill Company of 10 Park place, New York.

Reciprocal Trade.

The reciprocal commercial arrangement with Spain relating to Cuba and Porto Rico embraces the following items in the metal schedule, admitted free into the above dependencies in reciprocity and compensation for the admission into the United States of America free of all duty of the articles enumerated in the act of October 1, 1890, and by agreement between the two countries. After July 1, 1892, into all the established ports of entry of the Spanish islands of Cuba and Porto Rico, being the product or manufacture of the United States and entering directly from the ports of the said States: Schedule A, free of all duty. Iron, cast in pigs and old iron and steel; iron, cast in pipes, beams, rafters and similar articles for the construction of buildings and in ordinary manufactures. Iron, wrought, and steel in bars; rails and bars of all kinds; plates, beams, rafters and other similar articles for construction of buildings. Iron, wrought, and steel in wire nails, screws, nuts and pipes. Iron, wrought, and steel in ordinary manufactures, and wire cloth unmanufactured. Implements, utensils and tools for agriculture, the arts and mechanical trades. Machines and apparatus, agricultural, motive, industrial and scientific, of all classes and materials, and loose pieces for the same, including wagons, carts and hand carts for ordinary roads and agriculture. Materials and articles for public works, such as railroads, &c., when introduced by authorization of the Government or if free admission is obtained, in accordance with local laws.

Products and manufactures of the United States to be admitted in the islands named at a reduction of duty of 50 per centum.: Iron, cast, in fine manufactures or those polished, with coating of porcelain or parts of other metals. Iron, wrought, and steel in axles, tires, springs and wheels for carriages, rivets and their washers. Iron, wrought, and steel in fine manufactures or those polished with coating of porcelain or part of other metals not expressly comprised in other numbers of these schedules, and platform scales for weighing. Tin plate, in sheets or manufactured, per hundredweight. Copper, bronze, brass and nickel and alloys of same with common metals, in lump or bars, and all manufactures of the same. All other common metals and alloys of the same, in lump or bars, and all manufactures of the same, plain, varnished, gilt, silvered or nickeled. It is proposed to issue the schedules under reciprocal negotiations as soon as practicable after finally agreed upon between the United States and the country entering into the compact.

Among the papers recently published by the British Institution of Civil Engineers was one by G. R. Redgrave on the manufacture and properties of slag cement. It appears that not all blast furnace cinders are suitable, particularly not those which disintegrate spontaneously. The method of manufacture adopted is that of Bosse and Walters, who grind and mix cinder and slaked lime in a cylinder fitted with iron or steel balls. At the Carron Works the cinder carries about 30 per cent. of silica, 20 to 26 per cent. of alumina and 35 to 37 per cent. of lime.

At Lockport, N. Y., on the 20th inst., F. W. Matthiessen, the wealthiest zinc manufacturer in the country, of La Salle, Ill., was elected president of the Cowles Electric Smelting and Aluminum Company. Mr. Matthiessen has lately acquired a large block of the Cowles Company's stock with George Healey of Cleveland, and will assume the active business management of this extensive concern. The construction of a large plant, in addition to that here and at Stoke-on-Trent, England, will be commenced soon. It is designed to produce 20 tons of the pure aluminum per day in the new smelter, which will require engines of 20,000 or 30,000 horse power. The other officers elected at the meeting were: Alfred H. Cowles of Lockport, vice-president; Horace W. Power of Cleveland, secretary; A. T. Osborne of Cleveland, treasurer.

The Hampton Aluminum-Alloy Works.

We have received from W. J. Wilder, superintendent of the Aluminum Alloy Metal Company of Hampton, Iowa, a brief description of his plant together with some facts of interest concerning the metal invented by him. He says:

"The buildings used by this company contain about 8000 square feet of floor room, including a rolling mill, amalgamating room, and cutting, squaring and shipping rooms. The amalgamating room contains five furnaces, capable of turning out about 2 tons of metal per day, but there is ample space in the buildings to handle 5 tons Two railroads, the Iowa Central and the Chicago and Kansas City, pass through Hampton, and the works are so located that cars can be loaded at the doors. The history of the metal manufactured here is as follows: On March 10, 1885, I patented a process for coating metals. The following year I managed to put about 12 tons of the metal on roofs in different parts of the country, and, as stated in our circular, these roofs have stood the test without a coat of paint for five years and over. In 1889 I started a small plant at Yorkville, Ill., the entire output of which, after a short time, was secured under contract by the Stan-Aluminum Company of Canton, Ohio, for five years. The Hampton plant was then started about August of this year. Having experimented for the last two years with aluminum I found that I could add a small quantity of it to my alloy, adding greatly to its tenacity and not interfering with the ordinary method of soldering such as is used by tinsmiths. Two pieces of this metal can be united without solder by applying acid such as tinsmiths use and then passing the copper over it, but I recommend the use of solder. I do not propose to publish the exact method followed in the amalgamation, as several points are not protected by patents. The metal contains no iron or steel whatever, and there being nothing in it to corrode, I claim that it will, without paint, last as long as the building which is roofed with it. I am supported in my claim by tests made by some of the most prominent chemists in the country."

The concluding paper in William F. Durfee's series on the "Manufacture of Steel" has appeared in the November issue of the *Popular Science Monthly*.

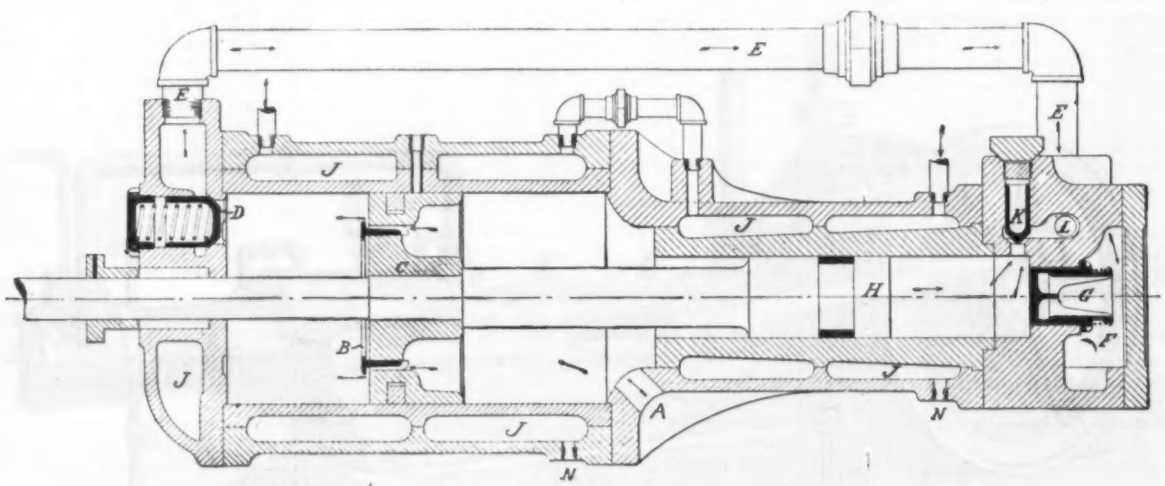


Fig. 2.—Longitudinal Section through Air Cylinders.

THE INGERSOLL-SERGEANT COMPOUND AIR COMPRESSOR.

Tests and Requirements of Structural Wrought Iron and Steel.*

BY ALFRED E. HUNT, PITTSBURGH, PA.

(*Concluded from page 689.*)

2. *The Number of Tests Required.*—No definite rule can be laid down as to the number of tests required to determine the exact quality of a lot of material. If the material be steel of practically one uniform section, and made by a single process, which is reasonably uniform in its operation, one tensile and one bending test for each melt of steel—that is, for each open-hearth heat or Bessemer blow—is usually considered sufficient. Should the sections vary, or the ingots be of different sizes, requiring more or less work on the steel, each such materially varying section should have a tensile and a bending test. Should there be a suspicion that any portion of the material has been burned in reheating for rolling or hammering, of course extra tests will be required. A provision incorporated in the Standard Bridge Builders' Specifications by parties who desired to make it the general practice, requires for each contract only four tensile tests and one additional test for each 50,000 pounds of material, not taking into account the possible non-homogeneity of the lot thus arbitrarily lumped together. But the absurdity of this labor-saving device has been generally recognized, and it is practically a dead letter in the Standard Bridge-Builders' Specifications today.

The advisability of keeping melt numbers distinct throughout the manufacture of the material, and stamping them upon each of the finished bars, has been the subject of considerable controversy. At most of the structural mills, however, it is now deemed important, not only to the inspector, but to the manufacturer, as facilitating the intelligent selection of material from stock on hand, that not only the original ingots, but also the blooms and finished material rolled therefrom, should be stamped with the melt numbers, and that the records of each melt should be kept so clearly that all required data of quality can be readily ascertained at any subsequent period.

Good open hearth or Bessemer steel is reasonably homogeneous as cast into ingots in each melt, but the quality of one melt by no means insures that of the next. It follows that the only satisfactory method of testing finished structural open-hearth or Bessemer steel (short of the separate testing of every piece singly, which is, as a general rule, impracticable) must be based on the melts as the units of quality, and hence that these must be kept separately traceable with the utmost certainty. The advantages of this system should be at once apparent to manufacturers; yet, strange to say, it has been adopted tardily and with reluctance in many works.

The number of tests required for wrought iron is still more difficult to fix. Not only does the raw material vary greatly in quality, but the process of manufacture without fusion does not offer any guarantee of ultimate approximate homogeneity. An inspector acquainted—as he ought to be—with the character of the stock used in making the iron, the size and make up of the pile from which the iron is rolled, and the methods of manipulation employed, can often form an intelligent judgment of the metal and dispense with many tests which he would otherwise require. In general, the usual practice is to obtain one tensile, one bending and one nicked bending test of each materially variant section, mixture of stock and character of pile in each lot of material or each day's work of the mills. Such tests will average perhaps five or six to the carload, the number varying considerably according to circumstances. Even though the inspector be acquainted with the work and satisfied as to the quality and uniformity of the metal, a certain number of tests for each job is required as a matter of record by the engineer for whom the work is done. Such a record is valuable, not only in case of an accident to the structure in which the material is ultimately placed, but also in questions of repairs or of extra loading. In such cases it is essential to have exact data regarding the quality of the material, as developed by the inspector's tests. Many parties also insist upon such records for personal vindication of the engineer or the corporation he represents as to the care that has been taken to see that all has been done that could be done to insure good quality in the material furnished.

3. *In what cases more than one test should be made or allowed before decision is reached.*—Manufacturers claim that where the test specimen does not fairly represent the material it is unjust not to allow a second trial upon a fairer specimen. On the other hand, some engineers instruct their inspectors that, as the selection and preparation of the test specimen rests mainly with the mill people, the failure to obtain a fair specimen is due to their own carelessness or misfortune, and second tests are not to be permitted. The objection to more than one test, if the first fails, is the difficulty of deciding which represents the material fairly, or of finding and rejecting that part of the lot which the faulty test did represent, and of being sure that there is not more of the same class of faulty material in the lot which will be passed by undiscovered.

The first test sometimes fails, manifestly because the specimen has been burned or has been cut so close to the crop end as to include a large flaw; or it has been unduly hardened by water on being suddenly plunged into snow or ice in winter while hot from the rolls, as sometimes happens to the ends of bars by careless handling. In such cases it is difficult to decide wisely and justly to both interests. At mills where much trouble of this sort occurs fast and careless work is being done and the reputation for this bad work soon becomes known, much to the detriment of the proprietors, who can only regain their prestige by a radical change in their methods, which usually includes changes in the mill management. At the same time a certain amount of it will occur at the best-regulated mills. In the practice of the writer, when additional tests are allowed, either the first test specimen must have been manifestly, in the judgment of the inspector, erroneously selected or else more than one satisfactory additional test should be made to counterbalance the evidence of the first and to prove that the material is all right. It makes a great deal of difference, of course, what the result of the defective test indicates. If it shows badly-burned material or non-homogeneous steel with high manganese (from the ferromanganese not being properly mixed in it), or brittleness from almost any cause, it is only in exceptional cases, under specially peculiar conditions, that second tests should be allowed.

The general rule may be laid down that if more than one test is allowed, where the first shows metal that should be rejected, it should be only in cases where the defective material represented by the first test can be identified and rejected, and where a further series of tests will prove with reasonable certainty that there is no more of the defective metal in the lot represented.

4. *The Way in Which Tests Should be Made.*—With the newer forms of automatic power testing machines now largely used there is very little opportunity to change the results as recorded by the machines. If the specimens themselves are properly prepared and placed in line in the testing machines the chances of error are few and more nearly concern the manufacturer than the engineer. Manufacturers have learned that improperly prepared specimens and carelessness on the part of those who work and keep their testing machines in order operate most severely against their own interests. It is the present experience of the writer that there is little cause for complaint at the structural mills throughout the country as to the way in which the tests are made.

5. *The Interpretation of the Tests and Test Requirements.*—It is unreasonable to require the same results from tests of iron or steel made on varying sections, even when the method of manufacture and the general arrangements for producing the crude material are the same. For instance, the same tensile tests should not be required from plate rolled from a given grade of ingots into 1¼ inch thickness, ¾ inch thickness and 1 inch thickness, for the reason that the 1¼-inch plate will certainly show evidence of cold-rolling, and the 1-inch plate evidence of not having had sufficient rolling at the low temperature which gives advantageous work to the metal. It may be remarked here that the use of a small amount of aluminum in the steel will cause the results in these thick specimens to be much more satisfactory, approaching those of the ¾-inch plate. Especially is this the case if some care is taken that, in rolling the thicker specimens, the finishing passes are not made at too high a temperature.

Test specimens cut transversely to the longer axis of the material rarely give as good results as specimens cut longitudinally. Especially is this true of iron, which shows a marked decrease in ductility and a very considerable decrease in tensile strength in specimens cut transversely. Few rejections are made upon the requirement for elastic limit in iron or steel. The usual requirement that the elastic limit for iron shall be 26,000 pounds per square inch, and for steel that it shall be at least one-half the ultimate, is very rarely unfulfilled. The elastic limit is not always a safe criterion of the quality of iron or steel. Many tensile tests show a satisfactory elastic limit that are very low in ductility. In tests of boiler plate the record of the elastic limit is rarely taken, although this seems to the writer to be an unwise omission. It would be advantageous to have the determination of the elastic limit, and, with the methods of testing usually adopted, it could be obtained with very little trouble and no extra expense.

The elongation in 8 inches length is the almost universal standard. It was adopted by the English Admiralty as being nearest to the 200 mm. length of the French. Kirkaldy still prefers the 10-inch length. The disadvantage of this length is that it means at least 2 inches more of length of bars or plates from which test specimens are cut—a matter of no small moment in the large number of tests required in daily practice in structural mills. That a length of at least 8 inches is advisable is shown by the increased irregularity in the results obtained with shorter lengths, the irregularities of the elongation and the method of obtaining it at the fracture very considerably increasing the errors in measurements. The old Government marine test specimen of 1-inch section is now admitted by all to be a manifest error.

The reduction of area in iron is a requirement which ought not, I think, to be very minutely interpreted, on account of the difficulty of measuring it accurately, due to the incipient opening up of the welds at the point of fracture. In steel the reduction of area is often the best in-

* Presented at the Glen Summit meeting of the American Institute of Mining Engineers.

dicator of the ductility of the specimen, and taken together with the character of fracture, which should always be noted, it is an important factor in the estimation of quality in this repect. The specified percentage of reduction of area is almost always obtained in the best practice, in iron as well as steel, and the difficulty with iron is not that the substantial requirement has not been reached, or even exceeded, but that the exact measurement is not easy, and if it is reported with professed accuracy for the satisfaction of the engineer, he must not infer too much from the figures.

No general rule can be stated for the demand as to the character of fracture under tensile tests, but it may be safely said that for both iron and steel 70,000 pounds per square inch tensile strength the fracture should show the flow of the metal—fibrous, not crystalline—to at least 80 per cent. in the case of wrought iron, and that in steel it should be silky rather than spongy and granular. In the interpretation of tensile tests of steel the hardness of the metal is an important element. It has been found by experience that bridge steel of over 64,000 pounds per square inch tensile strength is so hard that in punching it minute fractures will be made in the metal surrounding the holes, which will be so injured by the operation that tensile specimens taken from punched pieces show very considerable decrease in tensile strength.

The usual instruction given by engineers to inspectors is that steel which is above 62,000 or 63,000 pounds per square inch tensile strength should be held quite rigidly to the results of the tests in acceptance or rejection; but where the steel is milder, a test varying 1000 or 2000 pounds over or under the requirements of the specifications is not generally considered, by itself, a cause for rejection. In this connection it is well to point out that duplicate results taken upon the same test specimens, as shown in the tabulated reports of the committee of the American Society of Mechanical Engineers, exhibit a variation much greater than this limit, which is usually allowed in the acceptance of material. There are some engineers, however, who are very rigid in their requirements that all the material shall answer precisely all the tensile requirements. In such cases either the requirements should be very broad and lenient or the metal should be paid for at a considerably increased price per pound.

With wrought iron the general practice of engineers is to allow their inspectors a considerably larger variation in acceptance of iron than with steel. This practice, I think, is warranted. Wrought iron made in different districts of the country, from varying stocks, gives varying results. In Eastern Pennsylvania, where the furnaces have largely run in the past on foreign ores, the bar iron is somewhat lower in tensile strength, but is greater in elongation and reduction of area, than that made in the Western part of the State from Lake Superior ores. In the Eastern District it is easier to obtain the best bar iron with 48,000 pounds per square inch tensile strength and 20 per cent. elongation in 8 inches, while in the Western part of the State 50,000 to 51,000 pounds per square inch tensile strength is exhibited with 16 to 18 per cent. elongation in 8 inches. In either case the engineer can, in my judgment, safely trust the bar iron with the same unit strains.

With a specification for wrought iron similar to that outlined in my paper upon "The Inspection of Materials of Construction in the United States" (Trans., XIX., 911), I believe a reasonable allowance of a few thousand pounds per square inch, or a few units per cent. in ductility, according to the character of the metal being made at the mill, should be permitted to the discretion of the inspector.

The requirement of 52,000 pounds per square inch tensile strength for bar iron for structural purposes cannot, according to my experience, be met without many rejections by mills in general. Very few mills in this country, except those working charcoal iron or using steel scrap in the piles, could produce regularly such bar iron. An iron having this high tensile strength should be carefully tested for welding, as it is very apt to be dry and incapable of welding strongly, and if it satisfactorily answers both requirements, it should command a much higher price than ordinary good bar iron.

Since the price of soft steel (of not too rigid requirements) and that of wrought iron are now about the same, it is becoming a common practice to allow in specifications for structures the use of either wrought iron or steel, giving specifications for both. This practice has led, both at the bridge shops and at the mills, to the interpretation that the material may be furnished in both iron and soft steel of 60,000 to 64,000 pounds tensile strength per square inch, as it pleases their convenience. The writer has had several experiences of late where the mill people, under such specifications, have actually attempted to fill items of angles and plates partly in iron and partly in steel. This indiscriminate use of iron and steel, with their different moduli of elasticity and expansion and contraction under varying temperatures, cannot be good engineering practice. Of course this remark does not apply to all cases, but only to those in which the differing behavior of the two materials may produce injurious strains

6. *What Material the Tests Should Cover.*—As before explained, the series of tests with open-hearth or Bessemer steel usually cover each melt, and with iron each lot of varying section; but where some of the tests prove defective, they may fairly be construed to cover smaller subdivisions under certain conditions. If it can be shown that the cause of the trouble is with only one reheating furnace charge, or even with certain ingots or blooms near bridge walls or exposed to special punishment, it is manifestly fair to all interests to reject only the material that can be proved to be defective, taking further tests of the remainder of the lot.

7. *The Jurisdiction of the Inspector over Rejected Material.*—In one view of the subject the inspector, who ordinarily does not own any of the material (although the mill people claim that inspectors sometimes act as if they did, with the addition of the mill and all the property and people pertaining thereto), has nothing further to do with material that he rejects. Certainly he has no right, without the mill manager's consent, to maltreat rejected bars so as to prevent their being used for some other purpose. At the same time it seems to me that he has the right to mark rejected material in such a way that it may not by any accident or otherwise be shipped forward from the mills with the accepted material. For this purpose many inspectors have a private stamp for stamping rejected material, which seems to be a wise precaution.

8. *The Jurisdiction of the Inspector over Accepted Material*—The inspector should be furnished with lists of the material he has inspected or shipped on each carload, in order that he or his assistant, the inspector at the shop, may identify the material which he has passed as it is unloaded at its destination. For this purpose many engineers—it seems to me very properly—insist that their inspectors shall approve the itemized bills of lading of each carload of accepted material from the mills. The inspector should, where possible, see that material is properly loaded on cars for shipment, in order to prevent its being badly bent and twisted in transit. This is a matter of no little importance with the large bars of 60 and 70 feet now often ordered at the mills.

9. *The Right and Duty of Inspectors to Note and Report upon Methods of Manufacture*—Many mill people claim that if the inspector is furnished with material answering the requirements of the specifications, there their duty ends, and any investigation into the methods of manufacture is unwarranted and unnecessary and is prohibited. On the other hand, the manufacturers are constantly pressing for fewer tests upon the tonnage they turn out, and in the judgment of the writer the best way to reduce the number of such tests is to make the inspector familiar with the methods by which his material is made, and thus able to judge more accurately, by his knowledge of the uniform character of the stock used, the size of the ingots or piles or glooms from which finished material is rolled, and the manner in which the material is rolled or hammered. Without this knowledge and actual testing of the materials used, steel scrap ought not to be allowed to be piled with iron.

The Mechanical Engineers.

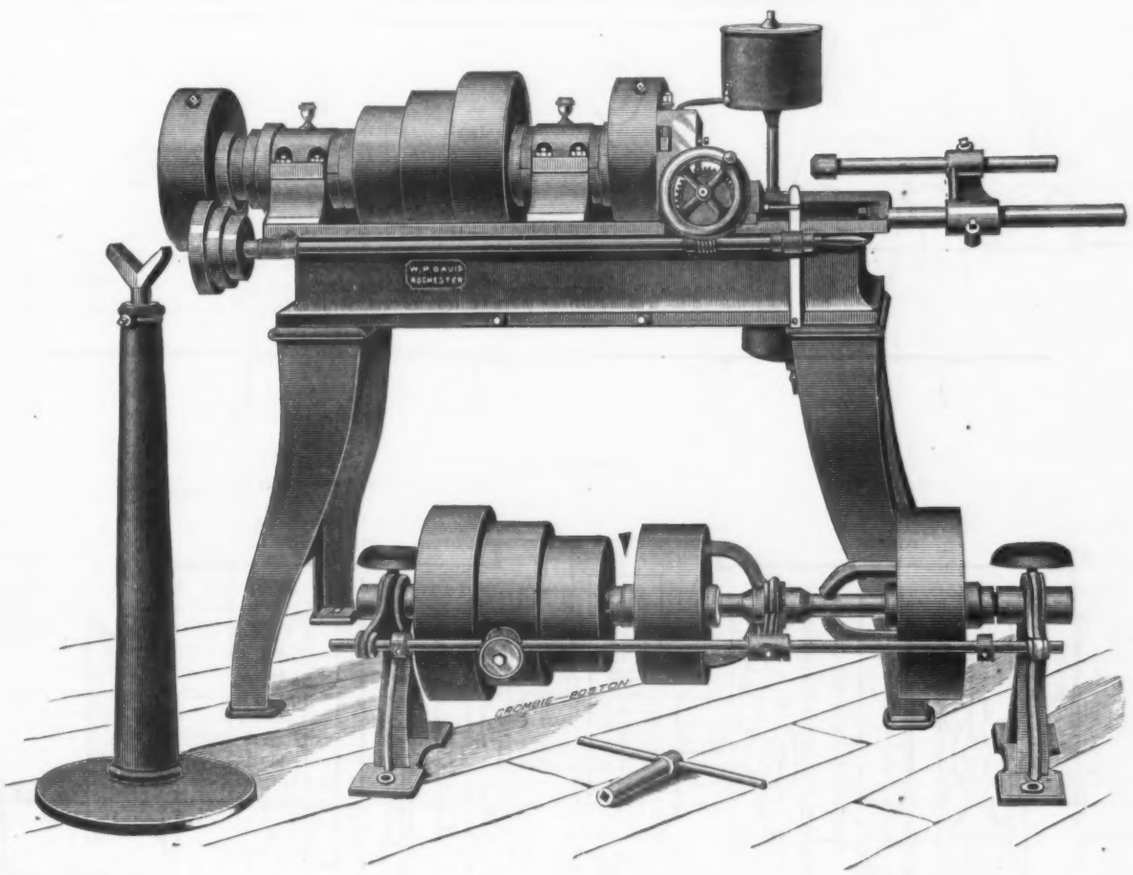
The annual meeting of the American Society of Mechanical Engineers will be held in New York, November 16 to 20, the sessions taking place at the society's house, 12 West Thirty-first street. The opening session Monday evening will be in the form of a social reunion with a collation and an address by President Robert W. Hunt. A business meeting will be held Tuesday morning and a session for the reading and discussion of papers in the evening, the afternoon being at the disposal of the members. Wednesday will be devoted to an excursion by boat to the Brooklyn Navy Yard and the shops of the De La Vergne Refrigerating Company, to be followed by a theater party in the evening. Thursday morning is set aside for professional papers and their discussion, the afternoon to local excursions and the evening for a reception at the Lenox Lyceum. A concluding session for papers will be held Friday. The following papers will be presented: "President's Address," by Robert W. Hunt; "Experiments to Determine the Rate of Rise or Fall of a Mercurial Thermometer under Different Conditions," "Test of Indiana Block Coal at the Chicago West Side Pumping Station," "Limitations of Steam Engine Economy," by A. F. Nagle; "The Value of Water Power," by Charles T. Main; "The Brooklyn Pumping Engine of 1860," by Samuel McElroy; "The Idiosyncrasies of Chimney Draft," by W. E. Crane; "Electric Power Distribution," by H. C. Spaulding; "Influence of the Steam Jackets of the Pawtucket Pumping Engine," by Wm. Kent; "A Combination Iron and Oak Pavement," by J. Wendell Cole; "Test of a Pulsometer," by De Volson Wood.

A verdict in favor of Alfred Earnshaw for $45,593.77 was rendered in the United States District Court, Philadelphia, in Mr. Earnshaw's suit against Isaac McHose & Sons to recover $56,390 and interest, under an agreement to accept the output of iron ore from a number of Spanish mines. The jury directed that $13,926.74 should be deducted for outlays made by the defendants to defray expenses for what was known as "quick despatch," enabling them to obtain the ore sooner.

The Globe Iron Works, at Cleveland, have closed a contract for a steel steamer 310 feet long for Samuel Mitchell of the Jackson Iron Mine, at Negaunee, Mich.

The Davis Cutting-Off Machine.

The accompanying cut illustrates a cutting-off machine of new design, built by W. P. Davis of Rochester, N. Y. The spindle bearings are large and long, and the cones are of ample width and diameter. There are two powerful chucks, one on each end of the spindle. A special feature of this machine is the tool post or holder, which is of unusual strength and stiffness. There is an automatic throw-off which stops the feed when the piece is cut off, and proves to be a very desirable attachment. The length gauge is provided with a finger at its forward end, which can be thrown over after gauging the length to prevent cramping the tool as the piece drops off. The countershaft has two changes of speed, making, with the changes on the cone, six different speeds for the main spindle. The pulleys on the countershaft are driven by a simple and efficient clutch, so that by the simple movement of the lever the speed may be accelerated as the tool approaches the center. This machine is made in two sizes, 2½-inch and 4½-inch. The machine shown in the cut is the 2½ inch. The 4½-inch machine is very similar in design, but is much heavier. An adjustable stand for the support of long bars is provided with the machine. Each machine is thoroughly tested before delivered and guaranteed to be perfect in every respect.



THE DAVIS CUTTING-OFF MACHINE.

The Crane Company, iron pipe manufacturers, began suit in the United States Court, in Chicago, against the Columbus Construction Company of New Jersey for $300,000 damages, and an attachment was also issued against the company on a claim by the plaintiff company for $103,715.26. The affidavit of vice-President A. M. Gilbert is that the last-named amount is due the Crane Company for iron pipe furnished in accordance with a contract made in June of last year. It seems that the pipe is now being used by the Indiana Natural Gas and Oil Company in building a pipe line.

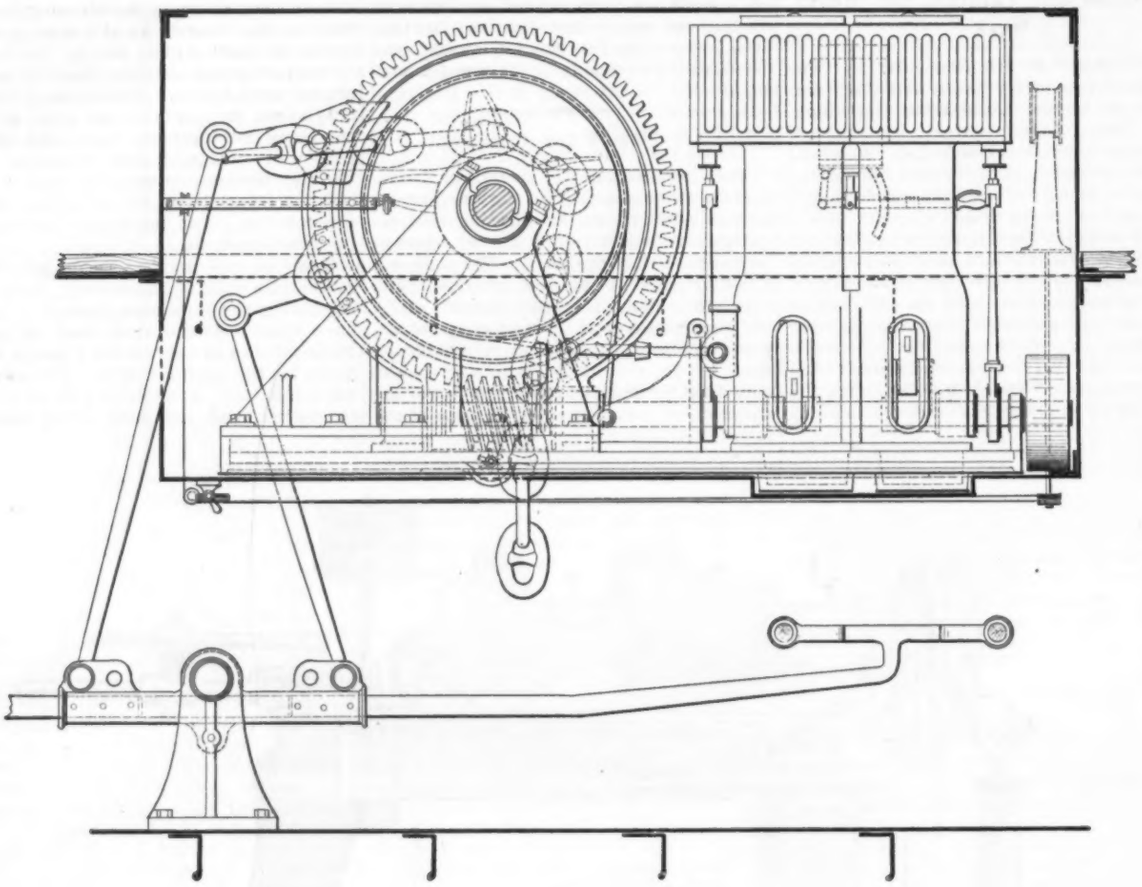
Air Pumps for Cruisers.

The reputation of American pump makers for excellence in design and manufacture and in skill in meeting new requirements will certainly not be lessened by the air-pump design for the main engines of some of the new cruisers. The floor space allotted is very limited, while the requirements of accessibility for repairs and smoothness and reliability in working are absolutely essential. In the combined air and circulating pumps of the Dolphin and Chicago, and in those of the Concord and Bennington, the manufacturers have dealt with the problem and produced smooth-working, reliable machines that require the very least amount of watching while in operation. On the trial trips of some of these ships the only care exercised was that of a small boy to put a little oil on the bearings of the rock shaft. The percentage of power of the main engine necessary to run the air and circulating pump was as low as 1 per cent.

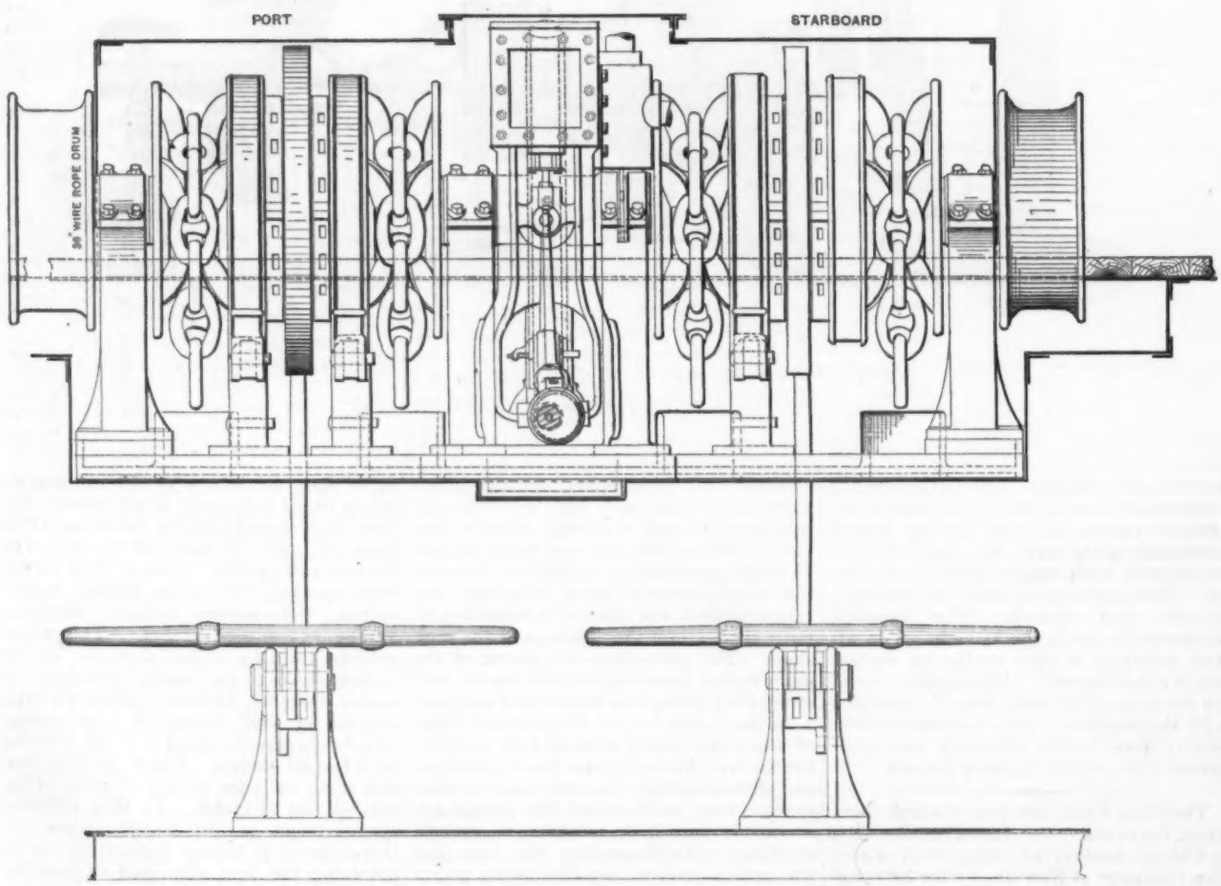
In the design for the air pumps of some of the large sets of engines now building for the New York, Cruiser No. 12, Indiana and Massachusetts, the economy of floor space is very great, while the pumps are accessible and give promise of smooth working, notwithstanding the fact that the steady load of the circulating pump is taken away. These air pumps consist of a pair of single acting vertical air pumps driven by a pair of double acting vertical steam cylinders coupled together by a double beam of wrought iron, the valve gear being operated from a point on the coupling beam. The steam cylinders thus coupled operate in the same manner as the ordinary duplex pump. The valves of both main and auxiliary steam cylinders are ordinary valves. The steam cylinders are bolted to a ribbed cast-iron platen; the pump cylinders are connected to the platen by means of steel columns. The barrels, buckets, plates for head valves and covers of both air cylinders are of composition. The air-pump buckets are packed with hemp.

The foot and delivery valves are placed at opposite ends of the vertical pump barrel, giving the minimum amount of clearance space between them and the pump buckets; they are accessible through hand holes in the pump barrel. The joint of the hand hole is made on the outside of the barrel, and the plate being really a taper plug, correctness of the inside of the pump barrel is insured at all times. The foot, bucket and delivery valves are of the same size, and all made of specially vulcanized soft rubber. Area of foot valves, clear opening, 130 square inches; bucket valves, 104 square inches; discharge valves, 104 square inches. The steam cylinders are 12 inches diameter and 18 inches stroke; air pump cylinders 25 inches diameter, 18 inches stroke for main engines of 4000 indicated horse-power. The floor space occupied is 5 feet 8 inches by 3 feet 5½ inches. The hight from bottom of air cylinder to top of steam cylinder is 9 feet 8¼ inches. In thus utilizing special talent in our manufacturers the Government is taking certain means of obtaining the best ships and engines the country can furnish.

St. Louis is to spend $10,000,000 on boulevards, and expects to build 30 miles of them.



Port Elevation.



Elevation Looking Forward.

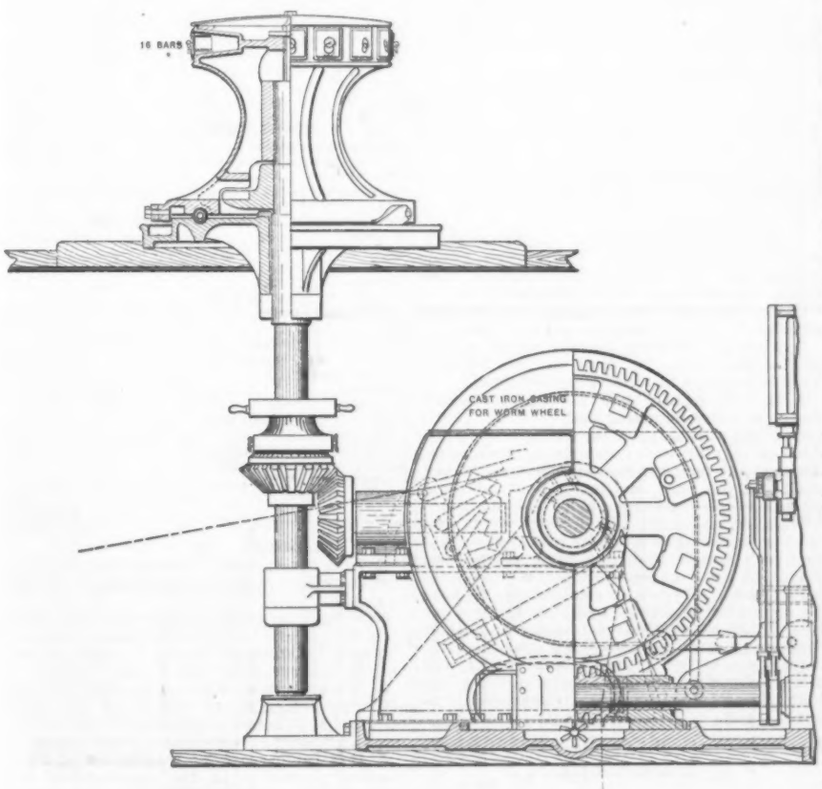
THE PROVIDENCE STEAM PUMP BRAKE WINDLASS FOR U. S. COAST LINE BATTLE SHIPS.

Windlasses and Capstans for Heavy Work.

Providence has for years been known, among all who care to learn of such matters, as the home of the steam-power windlass. Early in the century the change from rope to chain cables began, but until the development of the steam apparatus the heavy chain cables were handled by hand spikes, pump brake gear or hand capstan and windlass, requiring more men than for any other operation on shipboard. The business of the American Ship Windlass Company commenced in 1857 in a small way and gradually increased as the advantage of their machines became known. The purchase of and removal to the present works and available land adjacent was followed by extension of buildings and the organization of manufacture upon a much larger scale. The works are divided into a lot of special shops, the separate departments being equipped with special tools. Work is made to standard templates, and parts of any lots of machinery of a given size are thoroughly interchangeable, and are kept in stock to be shipped upon telegraphic order. Several large new machine tools have been lately installed, and the company are now making plans for another enlargement of their works. Several machines are employed upon two operations at once, such as boring and facing cylinders, boring and turning gears and planing and squaring up bed plates. Those parts of the shop where inflammable material is worked are protected by automatic sprinklers. The demands of the business have changed within ten years, for where patrons would then order a capstan or windlass and wait for it to be built, they now expect it to be shipped complete at short notice. For this reason the company are now carrying in stock more work in a finished and unfinished state than their entire capital represented a few years ago. The especially interesting construction at this shop now is the heavy work for Government cruisers and the tugboat windlasses with iron towing bitts, patented by Mr. Manton a year ago. The old style of wooden bitts was framed into the hull of the vessel itself; the new form makes the bitts a part of the bed plate of the windlass.

The company have lately entered into a contract for furnishing the windlasses and capstans for the United States battle ships and cruisers building by the William Cramp & Sons Ship and Engine Building Company of Philadelphia. The accompanying cuts show the types of windlasses that are to be used on these vessels.

The windlass for the battle ships is to be placed within a compartment on shipboard. It is of the latest improved steam pump brake windlass pattern and is so fitted that it may be worked by the hand brakes or the steam gear of the windlass. It is of the horizontal type and the engines driving the same are double and have inverted cylinders 15 inches in diameter, and are fitted with a very simple, efficient and easily handled reversing valve.



THE PROVIDENCE STEAM CAPSTAN WINDLASS FOR U. S. CRUISER No 2

The windlass will have four wild cats or chain grabs for handling the 2¼-inch stud link anchor chains. Each wild cat is fitted to be quickly thrown into or out of gear by locking pawls, seated within the driving heads, and is controlled for veering the chain by a powerful friction band brake. There is a drum on each end of the main shaft for handling a steel wire hawser of 1¼ inches diameter.

The engines drive the windlass through worm and worm wheel gearing. The worm wheel is of cast steel with cut teeth; the worm is of hard bronze with cut thread and it is so shaped that all the teeth of the worm are in contact with the wheel at the same time, the contact being a surface instead of a line, as is usual, thereby greatly increasing the wearing surface over the ordinary worm gear. There is also provided an automatic lubricating device and the gearing is partially incased in a light cast-iron casing.

On the engine crank shaft is mounted a balance wheel that balances the weight of the cranks, pistons and rods, and produces a smooth running engine, free from all jerking motion, thus conducing to durability of all the parts. The engines are very accessible and in the most convenient position possible. The locking gear of the windlass, the friction band levers and the reversing lever are all within reach of one person. The thrust bearing for the worm is provided with hardened steel and bronze washers, and it is made adjustable for wear. The driving heads, the locking rings and pawls, the pump brake clamps and all parts subjected to heavy strains and severe shocks are made of cast steel. All engine forgings are of forged steel finished all over. The windlass shaft is of hammered open-hearth steel of 8 inches in diameter and 17 feet long. All bearings are lined with bronze metal.

The windlass and the engines are bolted to a bed plate that is common to both; thus all parts are tied together by the same plate, and the whole must always remain in line. All parts of the machinery not capable of being easily oiled by hand while running are fitted with automatic lubricators. The cylinders and valve chests of the engines are completely lagged. The windlass is capable of raising both bower anchors at once at the rate of 6 fathoms per minute with 80 pounds of steam pressure and of exerting an aggregate stress of 400,000 pounds on both bower chains with steam of 130 pounds pressure. The estimated finished weight of the windlass is 70,000 pounds.

The Rivers patent chain indicator is applied to all Government windlasses under construction. By means of a friction device it shows how many fathoms of chain passes over each wild cat. The indicator dial is mounted in a nickel-plated case on a polished brass standard. It can be placed anywhere on the vessel; if desired two or more can be used for each wild cat, which is especially convenient, as one can be placed in the pilot house or on the bridge in addition to that at the windlass.

The windlass for the United States cruiser New York is nearly completed. The same general description of the battle ship windlass applies to this, with the exception that a capstan is employed in place of the hand pump brake connection. The drawings clearly show the different types. The windlass handles four 2¼-inch chains. It has cylinders 12 inches in diameter, and will weigh in complete working order 45,000 pounds.

Other windlasses are being built for the United States revenue cutter Levi Woodbury, and the lightship building by the Union Iron Works at San Francisco. Four light vessels for the Atlantic Coast to be built in Wheeler's yards in West Bay City, Mich., and two lighthouse tenders being built by the Globe Iron Works Company and also the United States Coast and Geodetic Survey steamer Hassler at San Francisco will all have windlasses from this establishment near Red Bridge.

A cylindrical steel car owned by B. A. Atkinson & Co. is being exhibited in Boston. The body of the car is a cylinder formed of steel plates riveted on 12 ribs of quarter iron, set 4 feet 9½ inches apart, and bent to conform to the shape of the car. The sides are almost entirely occupied by a dozen very wide windows, which, being perpendicular, stand out from the curving sides of the car several inches at the top of the window. These and the monitor roof, which is separate from the body of the car, somewhat relieve its cylindrical appearance on the exterior. The trucks are Jewett four-wheelers, and two heating boxes are hung under the car. The platforms are double, with heavy springs to take up the force of any collision.

WAGES IN STEEL MILLS.—II.

BESSEMER.

Jones & Laughlins, Limited, Pittsburgh, Pa.

STEEL DEPARTMENT.

Position.	No. employed.	Rate per 100 tons, 2240 lbs.	Total.
Metal wheelers, each	8	$2.11	$16.88
Coke wheelers, each	3	1.91	5.73
Cupola foreman	1	3.81	3 81
Cupola foreman's first helper	1	2.50	2.50
Cupola foreman's second helper	1	1.87	1.87
Ferroman	1	2.50	2.50
Vessel foreman	1	3.74	3.74
Vessel foreman's first helper	1	2.50	2 50
Vessel foreman's second helper	1	2 00	2 00
Scrappers, each	2	1.73	3.46
Vessel cindermen, each	3	2.27	6.81
Steel pourer	1	3.74	3.74
Pitmen, each	7	2.98	20.86
Pushermen, each	2	2.50	5.00
Sander, with sand or caps	1	2.98	2.98
Stopper setter	1	2.84	2.84
Stopper carrier	1	2.84	2.84
First regulator	1	2.27	2.27
Second regulators, each	3	1.73	5.19
Ladle liner	1	2.80	2.80
Ladle liner's helper	1	2.32	2.32
Stopper maker, total tonnage	1	1.05	1.05
Bottom maker	1	2.60	2.60
Bottom maker's helper	1	2.16	2.16

Jones & Laughlins, Limited, Pittsburgh, Pa.

NOS. I AND II BLOOMING MILLS.

Position.	No. employed.	Rate per 100 tons, 2240 lbs.	Total.
Roller	1	$7.00	$7.00
First roll hand	1	3.00	3.00
Second roll hand	1	2.75	2.75
Shearman	1	3.63	3.63
Shearman's tailer-in	1	2.44	2.44
Shearman's tongs	1	2.75	2.75
Shearman's hook	1	2.44	2.44
Shearman's buggy	1	1.80	1.80
Pit Furnaces "A and B."			
Heater	1	4.84	4.84
Bottom maker	1	3.00	3.00
Bottom maker's helper	1	2.50	2.50
Chargers, each	3	2.70	8.10
Covermen, each	2	1.50	3.00
Transfermen, per day	1	2.85	...
Reversing engineer	1	3.25	3.25

It is also understood that the following stipulations be agreed to in the Converting Department:

1. That the weights shall be taken as recorded at the department scales, at 2240 pounds per ton, for all ingots as taken from the casting pit, except such pieces as must be remelted in the cupolas or converters.

2. That additional help be furnished in the metal yard when in the judgment of the foreman in charge it may be needed.

3. That when an additional cupola is to be started on a regular turn, the coke wheelers will put up all the coke needed for lighting it.

4. That the cupola foreman and helpers shall be paid an allowance of 100 tons for fixing, when done off their regular turn.

5. That material for scrapping the vessels will be delivered to the scrappers on the second floor and as near the vessel nose as may be practicable; that the scrappers will hook on, skim and unhook the transfer ladle, and that when the material thus used exceeds 1800 pounds per heat, additional help shall be furnished at scrapper's rate.

6. That the vessel foreman and one helper shall be paid an allowance of 100 tons for fixing, when done off their regular turn.

7. That eight hours shall constitute a turn when lining the vessels.

8. That they shall be paid 12½ tons per hour for all overtime above eight hours.

It is also understood in the Blooming Mill:

1. That the weights shall be taken as recorded at the bloom shear scales, at 2240 pounds per ton, for all merchantable steel rolled on the blooming mill.

2. That one spell hand shall be furnished at the shears for the months of June, July and August.

3. That the roller and first and second roll hands shall each be paid an allowance of 100 tons at their respective rates, and the tongsman, tailer-in, shear hooker and buggyman be paid an allowance of 100 tons at $2.75 for changing rolls, and if one turn does not finish the change, the total rate of 100 tons shall be divided among the turns in proportion to the time spent by them on the change.

4. That the week's work shall begin at 12.01 o'clock Monday morning and shall cease on Saturday at 3 o'clock, p.m. In case of a breakdown or other extreme urgency, the men will roll out the pit furnaces, if the extra time thus required does not exceed one hour.

5. That an allowance of 100 tons shall be made for Monday morning turn on Nos 1 and 2 blooming mills, regardless of how much steel is made.

6. That in any class of work, whenever the firm may consider it necessary to put on extra help, the wages paid such help shall not increase the total cost per ton for such class of work.

Bellaire Nail Works, Bellaire, Ohio.

CONVERTING MILL.

Position.	Number employed.	Rate, per 100 tons, 2240 lbs.
Metal wheelers, each	6	$1.97
Coke wheelers, each	2	1.81
Bottom maker	1	2.69
Bottom maker's helper	1	2.16
Stopper maker, total tonnage	1	.99
Cupola foreman	1	3.81
Cupola foreman's helper	1	2.33
Cinder tapper	1	1.87
Manganese furnace foreman	1	3.00
Manganese furnace foreman's helper	1	1.87
Vessel foreman	1	3.74
Vessel foreman's helper	1	2.33
Cinder wheelers, each	3	2.27
Vessel scrapper	1	2.05
Steel pourer	1	3.74
Stopper setter	1	2.84
Stopper carrier	1	2.84
Pitmen, each	6	2.98
Iron and steel crane manipulator	1	2.27
Pit crane manipulator	1	2.27
Sander, when sand is used	1	2.98
Sander, when caps are used	1	2.50
Ladle foreman	1	2.56
Ladle foreman's helpers, each	2	1.73
First regulator	1	2.27
Second regulators, each	2	1.73

It is understood:

1. That the cupola foreman and helper shall receive 100 tons allowance for work of fixing cupola, and when two or more cupolas need fixing, one additional helper shall be given.

2. The company further agree to allow coke wheelers 50 tons for filling cupolas on Sunday.

3. That the company further agree to pay all tonnage men 100 tons for all repairs. Twelve hours or less constitute 100 tons.

4. It is also agreed that the vessel foreman's helper and first regulator shall each receive 100 tons credit at scale price for fixing vessel when done off regular turn; this fixing turn to be limited to 12 hours or less, and that one helper shall be given time and one-half at laboring price, and that all nose brick be put in by bricklayer, and that all mud, stone, wood and coke be delivered on stand by extra hands, and that each turn fix their respective vessels, and when the time exceeds 12 hours foreman's helper and first regulator shall receive 8⅓ tons for each additional hour, and when ordered out to scull out, reline and face, foreman and helper to receive 200 tons at scale price, and that two helpers receive two days at laboring price, and first regulator receive 160 tons at scale price, and that all mud, stone, wood and coke be delivered on the stand.

Bellaire Nail Works, Bellaire, Ohio.

BLOOMING MILL.

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Heaters, each	2	$4 84
First helpers, each	2	3.00
Second helpers, each	4	2.44
Furnace firemen, each	2	2.44
Roller	1	4.84
Reversing engineer	1	3.00
Roll hands, each	2	2.75
Ingot manipulator	1	2.75
Shearman	1	3.63
Shearman's helpers, each	4	2.44
Shear butt wheeler	1	2.00

It is understood:

1. For each change of rolls the full crew shall be ordered out and the company agree to pay each of the crew 100 tons at the respective scale price for each change.

2. The company also agree to furnish a man to do all oiling and greasing on rolls and shears.

3. They also agree to pay furnace firemen 100 tons at scale price for heating steel on Sunday night.

4. It is also agreed if less than 4 x 4 is rolled on blooming mill, that a special price shall be made for such sizes.

Laughlin and Junction Steel Company, Mingo Junction, Ohio.

CONVERTING MILL.

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Cupola foreman	1	$3.81
Cupola foreman's helper	1	2.34
Cinder Tapper	1	1.88
Metal wheelers, each	6	1.97
Coke wheelers, each	2	1.80
Vesselman	1	3.75
Vesselman's helper	1	2.37
Vesselman's helper	1	1.75
Cinder wheelers, each	3	2.16
Scrapper	3	2.05
Pit Foreman	1	3.75
Pitmen	9	2.98
Cap setter	1	2.50
Ladleman	1	2 57
Ladleman's helpers, each	2	1.74
Stopper setter	1	2.81
Stopper carrier	1	2.81
Stopper maker, total tonnage	1	.99
Bottom maker	1	2.70
Bottom maker's helper	1	2 18
Second regulator	1	1.70
Third regulator	1	1.44
Spiegelman	1	3.00
Spiegelman's helper	1	1.55
Pusherman, first	1	1.72
Pusherman, second	1	1.68
		Per day.
Limestone wheeler	1	$1.40
Metal yard laborers	2	1 60
Scrap lifter	1	1.75
Loom man	1	1.60

Laughlin and Junction Steel Company, Mingo Junction, Ohio.

BLOOMING MILL.

Position.	No. employed.	Rate per 100 tons, 2240 lbs.	Per day.
Roller	1	$4 84	.....
Hookers, each	5	2.75	.....
Heater	1	4 84	.....
Soaking pit bottom makers, each	2	3.00	.....
Drawers, each	3	2.46	.....
Shearman	1	3.63	.....
Shearman's helpers, each	4	2.44	.....
Test boy	1	....	$1.55
Mold washer	1	....	1.50
Pit laborer	1	....	1.75
Dinkey engineers, each	3	....	2.00
Switch boys, each	2	....	1.35
Blooming mill crane boy	1	....	1.10
Door puller	1	1.60	.....
Shear scrapper	1	1.60	.....
Crane boy at shears	1	....	1.25
Blooming mill engineer	1	3.00	.....
Blowing engineer	1	....	3.00
Second blowing engineer	1	....	2.70
Greaser	1	....	1.85
Wiper and oiler on Eng. table and shears	1	....	2.25
Machinist	1	....	3.00
Machinist's helper, includ'g carrying grease	1	....	1.90
Water tender	1	....	2.40
Panman	1	1.70	.....
Panman's helper	1	1.60	.....
Pipe fitter and sheet iron worker	1	....	2.00
Skull cracker engineer	1	....	1.60
Skull cracker foreman	1	....	1.80
Carpenter	1	....	2.00
Cinder runner	1	....	1.60
			Per week
Bricklayer	1	....	$22.00

It is understood:

1. That when both furnaces are working that both heaters and helpers shall get the run of the mill.

2. It shall be further understood that when on with cold steel exclusively heating shall be 39 cents per ton and helping 15 cents per ton and the balance of the mill double tonnage.

3. It is further agreed that the company pay all tonnage men at the rate of 100 tons while on repairs, 12 hours to constitute a day on vessels and 8 hours on cupolas.

4. It is further agreed that in case of a mechanical breakage in the operation of the plant and the foreman requests the men to stay pending repairs the men shall receive 100 tons for that turn.

5. When changing rolls the full crew shall be ordered out and receive 100 tons for said change.

6. The company also agree to furnish a man to grease the rolls, tables and shears.

7. It is understood and agreed that during the continuance of this contract the owners of the property, the Laughlin Nail Company and the Junction Iron Company, shall be supplied with the slabs from this plant.

8. It is further agreed that when on billets less than 4 x 4 a special price shall be paid.

Belleville, Ill., Steel Company.

CONVERTING MILL.

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Cupola foreman	1	$3.81
Cupola foreman's helper	1	2.50
Cinder tapper	1	1.87
Vesselman	1	3.75
First helper	1	2.35
Second helper	1	1.75
Steel pourer	1	3.75
Pitmen, each	7	2.98
Stopper setter	1	2.84
Stopper carrier	1	2.80
First helper	1	1.85
Second helper	1	1.65
Ladle liner	1	2.80
Bottom maker	1	2.50
Bottom mixer	1	2.00

It is understood:

1. That first and sscond vesselmen be paid 100 tons for sculling and fixing vessels, provided that said sculling and fixing can be done in 12 hours or less, but should it take more than 12 hours they shall be paid at the rate of 9⅓ tons for each additional hour.

2. That in case a stop is made longer than is specified for the tonnage job, the company shall be at liberty to employ such help on repairs as may be available at current day rates, preference being given to men of the converting department.

3. The company also agree to employ two regular pushermen.

4. Company to weigh and pour iron into vessels.

5. Cupolamen and vesselmen to be allowed 25 tons each, when called out to start the mill.

Belleville, Ill.

BLOOMING MILL

Position.	Number employed.	Rate per 100 tons, 2240 lbs.
Roller	1	$4.84
Rougher	1	3.63
Hookers, each	4	2.75
Shearman	1	3.63
Shear Tailer-in	1	2.44
Heater	1	4.84
Bottomman	1	3.00
Chargers, each	3	2.70
Engineer	1	3.00

It is understood:

1. That in case of breakage, and the men are held until 5 o'clock, they shall be paid not less than 100 tons, but if dismissed at any quarter of the day, in that case only, actual tons made shall be paid for. This rule applies to Converting and Blooming Departments, but until the mill has a capacity of 100 tons or over, the above clause, referring to holding the men pending repairs, the rate shall be based on average tonnage made.

2. That if billets less than 4 x 4 are made on blooming mills, that an extra price shall be made for those sizes.

CLAPP-GRIFFITH PROCESS.

Oliver Iron and Steel Company, Pittsburgh, Pa.

CONVERTING DEPARTMENT.

Position.	Number employed.	Per 100 heats.
Cupolaman	1	$9.45
Cupolaman's helper	1	5.50
Troughmen, each	2	5.50
Vesselman	1	7.75
Vesselman's first helper	1	5.50
Vesselman's second helper	1	4.75
Ladleman	1	6.30
Ladleman's first helper	1	5.25
Ladleman's second helper	1	4.50
Tapper	1	5.50
Tapper's helper	1	4.50
Manganeseman	1	4.50
Capper	1	4.50
Pulpit boys, each	3	2.90
Pit foreman	1	6.00
Pit foreman's helpers, each	3	5.50
Engineer blowing engine, per day, 12 hours	1	2.25
Engineer pit locomotive, per day, 12 hours	1	2.10
Stocker	1	5.50
Stocker's helpers, each	4	4.50
Coke wheeler	1	4.50
Scrap wheeler	1	3.50
Bottom maker	1	2.35
Bottom maker's helper	1	1 90
Cindermen, each	3	3.50

Oliver Iron and Steel Company, Pittsburgh, Pa.

BLOOMING MILL.

Position.	Number employed.	Per heat.
Heater	1	$0.10
Heater's helpers, each	5	.06
Roller	1	11
Roller's helpers, each	2	.07
Leverman	1	.09
Shearman	1	.06
Shearman's helpers, each	2	.05½
Shear tongsman	1	.05¾
Crane boy	1	.02⁹/₁₀
		Per 100 billets.
BILLET MILL.		
Rougher	1	$1.35
Catcher	1	1.10
Hook-up	1	.86
Buggyman	1	.86
Drag-outs, each	2	.86

Billets to weigh 200 pounds or over.

NOTE.

1. That no billets smaller than 4 x 3 be made on the blooming mill.

2. It is further agreed that in case of a mechanical breakdown in either department, causing a stoppage of the work, the men shall remain under orders for 30 minutes. At the expiration of 30 minutes the manager shall decide whether he will hold the men longer or not, and for all time afterward that he holds the men they shall be paid at the rate of 4⅝ heats per hour until work is resumed, after which the men shall be paid for what they make; in subsequent breakdowns on the same turn the rate shall be that if the men are held longer than half an hour and work is resumed the men shall be paid for the half hour at the rate of 4⅝ heats per hour; if work is not resumed at the end of the half hour no allowance shall be made for it.

3. That an extra tongsman be furnished by the firm when the new soaking pit is working.

4. That when blooming mill is off and converting mill is on and ingots being stocked, the men shall be furnished by the firm to stock steel back from the pusher.

5. That the vessel helpers be paid at the rate of .5 heats on patching days.

OPEN HEARTH.

Linden Steel Company, Limited, Pittsburgh, Pa.

MELTING DEPARTMENT.

1. That one furnace be considered one job, and that melter be under pay while making and cutting down bottom.

Melter's rate, per day, $5.

2. That firm find some employment for runner makers when only one furnace is working.

3. That 12 heats constitute a week's work on No. 2 furnace, and 14 heats on Nos. 1 and 3 furnaces, during one week, and that one-half day's pay be given both crews on a furnace for each and every heat more than 12 heats made on No. 2 furnace, and more than 14 heats on Nos. 1 and 3 furnaces, during one week.

4. It is understood that in case changes are made in the method of working, or the facilities at the furnaces, to admit of more heats being made, that a readjustment of this scale will be made at such time.

5. That when furnaces are being repaired the preference of the work be given to the crew, and that they receive $1.50 per day, the firm reserving the right to discharge those refusing to work.

6. That furnaces commence charging not later than 10 a.m. on Saturday; if not charged again the day turn to receive one-half day's pay; if charged later than 10 a.m. and up to 4 o'clock men to get full time.

BLOOMING MILL.

Position.	Number employed.	Rate per ton, 2240 pounds, for ingots 12 x 12
Heater, rate per ton	1	$0.12
Bottom maker	1	.06¼
Heater's first helper	1	.06¼
Heater's second helper	1	.05¾
Coverman	1	.06
Screwman	1	.12
Rougher	1	.07
Hookers, each	2	.05¾
Shearman	1	.04
Tableman at shears	1	.03¼

NOTE.

1. Thirty-three and one-third per cent. to be added for 3 x 3 billets.

2. That 66 hours constitute a full week's work.

3. That after a mechanical breakdown, if the men are held by the firm over one hour and 30 minutes, pending repairs, they shall be paid such proportion of their 65-ton rate per 11¼ hours as shall correspond to the time they are thus held.

4. That if the firm make additions and improvements so as to increase the product, this scale shall be readjusted at that time, proportionate to the tonnage produced, and prices paid at other mills of a similar character

5 If the firm make changes requiring a smaller billet to be made, a price shall be agreed upon to correspond with the tonnage produced.

BAR MILL—18-INCH TRAIN.

Roller.....85c. } Per ton, 2240 pounds, merchantable steel.
Heaters...70c. }
Catcher...55c. }

10-INCH MILL.

Heater, one-fourth of Guide Mill prices.

Roughers, between them, one-fourth of Guide Mill prices.

NOTE.

1. That firm furnish help to heaters to pull up all blooms weighing 160 pounds or over.

Plate mill engineer, per day of 10 hours, $2.75
Water tender, per day of 12 hours..... 2.12½

Jennings Brothers & Co., Limited, Allegheny City, Pa.

STEAM HAMMER AND OPEN HEARTH FURNACE.

Position.	4 x 7 and larger size slabs.	5½ x 5 to 4 x 4 and sizes which sq. same.	Under 4 x 4 to 3 x 3.	Under 3 x 3 to 2 x 2.
	Cents.	Cents.	Cents.	
Hammerman	40	50	60	
Heater	29	44	56	
Two levermen, each	25	35	48	Double spring steel price.
Back tongs	25	35	48	
Heater's helper	16	25	36	
Rougher	17	26	36	
Hammer driver	17	29	36	

All prices to be for work from 12 inch square ingots of all carbons. Prices to be for a gross ton of 2240 pounds of billets or slabs.

Jennings Brothers & Co., Limited, Allegheny City, Pa.

OPEN-HEARTH FURNACE.

Position.	Number employed.	Per day.
Melter	1	$5.00
First helper	1	3.00
Second helper	1	2.25
Chargers, each	3	1.90
Pit Hands.		
Ladleman	1	2.25
First pitman	1	2.25
Helpers, each	2	1.75
Bottom maker	1	2.00
Gas maker, on each turn	1	2.25

If natural gas is used no gas maker will be required.

It is understood:

1. That 14 heats on No. 1 furnace shall constitute a week's work, and all over to be paid pro rata.

2. That for all heats over 14 each turn will receive one-half day's wages for each heat. If delayed by not having gas or material, full wages shall be paid for time employed.

3 That the furnace be ready at all times to be charged on Saturday morning at 8 o'clock. If delayed in any way on account of furnace crew a proportionate day's work to be paid for, according to the work done.

4. That when furnace is being repaired, the preference of the work to be given to the crew, and that they receive $1.50 per day; the firm reserving the right to discharge those refusing to work.

5. That all combination molds used in pit be racked and keyed, and placed in position for pitman to handle.

Apollo Iron and Steel Company, Apollo, Pa.

OPEN-HEARTH DEPARTMENT.

Position.	Per ton, 2240 pounds. Ingots.
First helpers	$0.9½
Second helpers	.5¼
Ladleman	.8¼
Leading pitman	.6¼
Pitmen	.5¼
Bottom maker	.5¼

Flowing furnaces to be paid extra as follows:

Helpers, per day	$2.50
Melter, per day	5.00

Apollo Iron and Steel Company, Apollo, Pa.

HAMMER SHOP.

Position.	Soft.	Slabs.	Hard.
Hammerman	$0.27	$0.37.6	$0.41
Heater	.24	.32.6	.37
Leverman	.21	.26.6	.30
Leverman	.21	.26.6	.30
Back Tongsman	.21	.26.6	.30
Heater's helper	.12	.16.6	.19
Rougher	.12	.16.6	.19
Ham driver	.12	.16.6	.19

Moorhead, McCleane & Co., Pittsburgh, Pa.

OPEN-HEARTH FURNACES.

	Per day.
One melter for each furnace	$5.00
One first helper for each furnace	3.00
One second helper for each furnace	2.25
Three chargers for each furnace, each	1.90
One pull-up for each furnace	.75
Wages for Pit Hands.	
	Per day.
One ladleman for each furnace	$2.25
One first pitman for each furnace	2.25
Two helpers for each furnace	1.75
One bottom maker for each furnace	2.00
One craneman's helper	1 55

Fourteen heats on Nos. 1 and 2 furnaces to constitute a week's work, and all over to be paid pro rata.

Kirkpatrick & Co., Limited, Leechburg, Pa.

OPEN-HEARTH DEPARTMENT.

Position	Number employed.	Rate per ton, 2240 lbs.
First helper on furnace	1	$0.14½
Second helper on furnace	1	.10
Stockers, each	2	.10
Pit foreman	1	.12
Pit foreman's helper	1	.08
Pitmen, each	3	.08
Pull-up	1	.03½
Crane boy	1	.03¾
Ladleman	1	.12½
Bottom maker	1	.08
		Per turn.
First helper, attending furnace on Sunday	1	$2.25
First helper, cutting and making bottom	1	2.25
Second helper, cutting and making bottom	1	1.50
Stockers, each, cutting and making bottom	2	1.50
Pit foreman, while bottom is being cut	1	2.00
Pitmen, while bottom is being cut	2	1.40
Ladleman, while bottom is being cut	1	1.90

All men are paid for the total tonnage made out of the furnace at the above rate.

The Lewis Pickling Maching.

The accompanying illustrations show a vertical section and plan of a new design of pickling machine recently patented by David Trevor Lewis, Lewis Block, Pittsburgh, Pa. The apparatus is a pickling machine for use in preparing iron or other plates preparatory to their being coated with spelter, tin or terne mixture. Fig. 1 is a vertical section and Fig. 2 a plan view, from which all of the features of the apparatus will be readily understood. Referring to Fig. 1, it will be seen that the mechanism includes a vertical cylinder embraced and supported by a bed plate or frame, which it is explained may be further held down with anchor bolts in the pier supporting the bed plate. At each of the three arms or corners the bed plate is fastened to the lower end of a strut which in the present case is made of pipe. The upper ends of the struts are fastened to a collar or guide ring which is thus held above the center of the cylinder. Through this collar or guide ring the plunger passes into the cylinder and is operated by steam, water or air pressure by means of a three-way valve. When the pressure is turned on the plunger goes up, and when the valve connects the cylinder with the exhaust pipe the plunger by its weight and load displaces the steam, water or air and goes down. In order to prevent the plunger from pressing through the upper end of the cylinder a collar, as shown in Fig. 1, is cast on the lower end, which catches against a shoulder underneath the stuffing box inside the upper end of the cylinder, the lower end of the cylinder being provided with a loose head or cap to permit the insertion of the plunger. As indicated in the engravings, the plunger is sufficiently long to reach through the entire length of the cylinder and up through the guide ring. To the upper end is fastened a casting consisting of three arms of equal length reaching out horizontally and at equal angles from each other, as shown in Fig. 2.

At the outer ends of these arms are vertical holes through which pass the upper ends of rods which are provided with stoppings and nuts to prevent any vertical motion, but permit them to revolve freely in the holes. The lower end of each rod is fastened to the middle of a horizontal beam, near the end of which are attached the upper ends of flanges arranged in two pairs, each dividing out on each side of the beam. The lower ends of the flanges can thus be swung out and in, and each pair is attached to the side of the crate for holding the sheets to be pickled.

The crates are horizontal rectangular frames with internal cross pieces into which are fastened a series of vertical pegs forming longitudinal rows in which the sheets are put and held in an upright position. It will thus be seen that one crate can be hung to each end of the three arms of the top casting and three different motions can be given the crates—namely, a vertical motion by raising and lowering the plunger, one general circular motion around the plunger, and one individual motion around each suspension rod. There are rectangular tanks, as shown in Fig. 2, placed around this apparatus, at equal distances from it, the tanks being placed at an angle of 60° with one another. The arms of the top center are made of such a length that two suspension rods come above the centers of two tanks at the same time. Each end of the beams, which are placed crosswise above the crates, projects outside the point of attachment of the flanges, and on each end of the beams is a vertical roller revolving on top and projecting at the end of the beam. On each of the two longitudinal top ends of the tanks guides are fastened, between which the rollers can pass when lowered into them. These guides are placed at a suitable incline, the guides on the inner side of the tank sloping one way and those on the outside sloping the opposite way. Thus, when the crates are raised up to the highest point the rollers are above the ends of the guides and the cross arms with the three hanging crates can pass above and clear the tanks, but when the arms are placed above the center of the tanks the crates can be lowered into the tanks and at the same time be given the circular or rotary motion by means of the rollers or guides.

Only muriatic acid is used, instead of muriatic and sulphuric, as is now the practice. One of these machines, we are informed, is now in successful operation in the new tin-plate plant of the St. Louis Stamping Company, St. Louis, Mo., and several others are in course of construction and will be in operation in a short time.

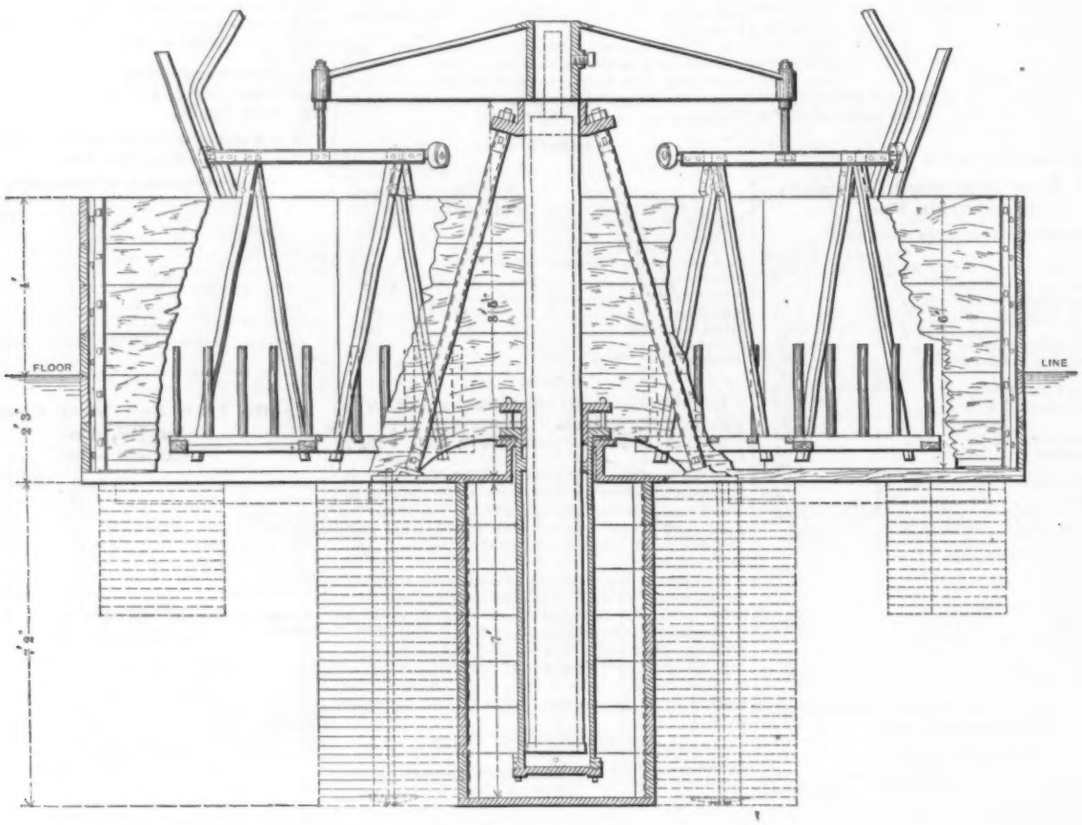


Fig. 1.—Vertical Section.

THE LEWIS PICKLING MACHINE.

There has recently been a complete change made in the management and officers of the New Philadelphia Iron and Steel Company of New Philadelphia, Ohio. The firm have largely increased the quantity of their output by the addition of new improved and costly machinery and methods. They manufacture steel and iron sheets, No. 10 to 30 gauge, suitable for all purposes, and especially for stamping, tinning, double seam, crimped and corrugated roofing and fine stove pipe. Geo. Reeves, the president and manager of the company, has himself been a large consumer of sheets and plates the past 20 years, which together with his 25 years' experience and acquaintance with rolling mills, also roofers and other consumers of sheets, enables him to appreciate the requirements of customers. The firm have secured the services of Theo. D. Morgan as assistant manager and superintendent of their works. The plant consists of 22 puddling furnaces, 12 heating furnaces, 2 trains of muck and sheet bar rolls, 1 fire bed mill and 4 mills for light sheets; also

1 train of rolls for cold rolling, 3 double box annealing furnaces, squaring shears, and everything required in a plant. The buildings are made entirely of iron, as follows: Puddle mill, two buildings, 50 x 210 feet; muck and bar mill, one building, 105 x 120 feet; sheet mill, one building, 130 x 120 feet; annealing department and warehouse, 60 x 200 feet; office, 20 x 40 feet.

Scarcity of Stove Molders.

The Western stove manufacturers are considerably annoyed this year by the scarcity of molders. With very few exceptions, the selling departments of all the leading companies are complaining of the slowness with which their requisitions are being filled by the manufacturing departments. This is especially irritating in view of the fact that the demand for stoves is so much heavier than it has been for years. The opportunity is offered to managers of sales departments to distinguish themselves by a season of brilliant success in distributing goods, only to find they are limited in the supply of stoves. Old and well-established foundries are no better off in this respect than new ones, which might reasonably be supposed to have the most trouble in securing a good organization of workmen. Union shops and non-union shops are also suffering alike.

The cause of the scarcity of molders is alleged to be two-fold, partly owing to the dullness of the stove trade for the past few years and partly to the discrimination against boys by the unions. It is hard to tell which of these influences is of greater importance. Serious inroads must have been made in the general force of stove molders over the country by the long-continued dullness of trade. When stove foundries were obliged to run on short time and to lay off part of their regular force, it was not to be expected that the idle men would linger long in the hope that they would be re-employed. They drifted into other classes of foundry work, or perhaps engaged in other and entirely different occupations. Many of them may never return to work in stove foundries, while others who would be glad to do so have, perhaps, not heard that men are again wanted. Every industry becomes more or less demoralized in passing through a period of severe depression, but the extent of the demoralization is not realized until a return of prosperity makes it desirable to resume in full.

The discrimination against boys by the trades unions is regarded in some quarters as the principal cause of the scarcity of molders. It is claimed that the number of apprentices permitted in a molding shop should be largely increased over the present limit made by the unions or the question of skilled labor will become a still more serious matter very shortly. Recalling the molders who have drifted into other lines is only a temporary relief. The future must be provided for also, and the only way in which to prepare for the demands of the future is by educating the boys of the present day. They will then be able to fill vacant places as they occur or to meet the demand for more help as industries expand. So seriously is this matter regarded that projects have been discussed for the establishment of molding schools, through the co-operation of a number of manufacturers. Instruction would there be given in a practical way by a competent molder, the school room being located in a foundry, purchased or built for that purpose. Thus all friction would be avoided with trades unions in working foundries, while a force of molders would be created to meet the growing necessities of the trade.

The manual training schools in various parts of the country are felt to be doing a good work in this direction, but there are too few of them. Many more of them should be established to be of benefit to special trades and to scattered localities. Meanwhile a great deal could be done if the stove manufacturers would themselves start training schools.

The steamship Rome of the Peninsular and Oriental Line was recently lengthened from 430 to 450 feet in one of the Greenock yards by a rather novel method. In order to add this 20 feet to the length of the vessel it was proposed to cut away 102 feet from the old bow and build on 122 feet of new structure. In doing this the new section was constructed in a dock while the steamer was making her regular voyages. Then the new bow and the steamer were floated together into a dry dock, the water was pumped out, and 102 feet of the forward part of the steamer was cut away. Water was again let into the dock in order to float the new bow into position for joining to the old hull. The fit of the two portions was exact, and the work of uniting them was easily and speedily done. The vessel will be ready for sea again in a few weeks, and then the Carthage, of the same line, will undergo similar alterations.

The Supervising Inspector-General of the Steamboat Inspection Service has issued a circular to inspectors of steam vessels and gun manufacturers, which contains an interesting report by Capt. R. Birnie. He recommends that tests be made of the guns used for propelling life lines in the Life Saving Service. Among those referred to are the Snelling, Patten, Dimond and Hunt guns.

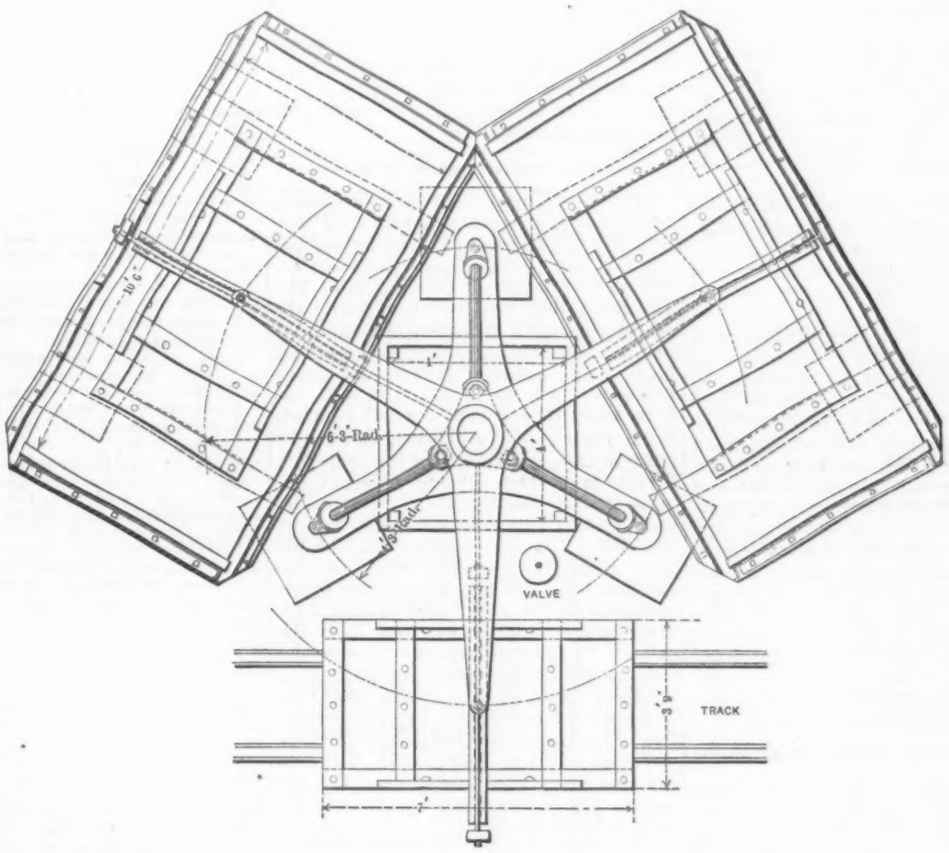


Fig. 2.—Plan.

THE LEWIS PICKLING MACHINE.

WORLD'S FAIR NOTES.

Much to the gratification of the construction department and the contractors for the Mines and Mining, Horticultural and Administration buildings, iron work is at last coming along pretty well.

Work at the Manufactures Building is the first to be carried on at night, owing to the appliance of the electric light. Three gangs of men, in the 24 hours, will hereafter be regularly employed.

"Staff" covering has been commenced on the roof of the Woman's Building; the development of the roof-garden lines is proceeding satisfactorily, and construction in all branches of this building is getting along very rapidly.

Foundations for Machinery Hall were commenced during the week. On the Transportation Building excellent progress is being made, especially on the eastern extension, in which the finishing woodwork is now being made upon the great "golden gate."

The foundation work of the Fine Arts Building is being carried on so expeditiously that Superintendent Ulrich of the landscape department can scarcely raze the trees that are in the way of the building procession in time to keep pace with the work.

Several hundred piles were driven for the foundation of the Government Building. The exterior work is to be completed before winter, so that the interior may be finished during the season of cold weather.

Designs for a big agricultural annex have been ordered by the Committee on Grounds and Buildings. The annex has been planned in accordance with the ideas of Chief Buchanan. The structure will be erected on the south side of the main building, and be 500 feet long and 300 feet wide. Through it, running east and west, will be three aisles, each approximately 50 feet wide. As the annex will be constructed on the site of what is now a lagoon, the building will stand on piles and apparently rise from the water's edge. Running along its south side will be a promenade 40 feet wide. In the opinion of the exposition officials, there has never been provided a fair building for agricultural exhibits with such beautiful surroundings as will grace this structure.

To Reproduce the Tower of London.

A cable dispatch from London, dated October 21, states that an English company propose to erect for the Chicago World's Fair a *fac-simile* of the Tower of London.

Mr. Armstrong, the theatrical manager, will sail by the Teutonic, November 4, to secure the site and go over the ground. It is proposed to build the tower of expanded steel, the invention of J. F. Golding of Chicago. The imitation of the Eddystone Lighthouse, so important a feature of the naval exhibition in London, was built of this metal.

The steel will be manufactured in Chicago and the tower will be constructed by American workmen, under the direction of English designers, who have undertaken to reproduce the ancient and historic building exactly as it stands at Tower Hill, with the exception of the moat and the surrounding walls, which are not of interest and would occupy too much space. The inside walls, towers, gates, &c., will be painted so as to represent exactly the original, and the contents, such as ancient armors, weapons, guns, arms both antique and modern, the crown jewels of England and the instruments of torture will all be reproduced with the utmost fidelity. The costumes of the beef-eaters, with their flat caps and emblazoned tabards, will be exactly copied, as well as the uniforms of the soldiers on guard, even to the least detail. One of the crack English military bands will come over to play on one of the open spaces within the walls. It is understood that the capital is ready to carry out this scheme if Mr. Armstrong's mission to America prove successful, and the British Government will afford every facility for procuring correct and appropriate designs.

Observation Towers.

The Ways and Means Committee have decided to grant permission to W. Z. Partelle & Co. to erect inside the fair grounds five steel towers 250 feet high. They will have three elevators running to the top and one elevator to the first landing. The base, 100 feet square, will be inclosed and used as a buffet. The company have decided to erect one inside the grounds at the head of Sixty-third street by January 15, and will have a gangway erected over the fence to enable those who desire to view the grounds before the fair is open. The others will be put up before the opening of the fair. The directors are E. C. Spinney, William H. Williams, D. H. Hayes, Warren Stone, William Z. Partelle. The company, it is claimed, will commence operations at once.

Another High Tower Scheme.

Projects for high towers are still coming forward. The latest plan published consists of a three-cornered steel structure, 350 feet at the base each way and 1500 feet high to the top of the flagstaff. The Chicago Columbus Tower Company have nearly completed arrangements to build such a tower near Fifty-seventh street and Stony Island avenue. It will cost about $650,000. All the stock, it is said, has been subscribed except a small amount. W. Z. Partelle of Washington, D. C., who is one of the main movers of the company, expects to complete all arrangements soon, so as to start building the foundations by January and complete the tower by July 15, 1892. The first landing will be 500 feet from the ground, with double pavilions, one 20 feet above the other, each suitable for a café and dancing hall. Six electric elevators will run from the ground to the first landing. The second landing will be 900 feet above the ground, the third 1,200, and the fourth 1400 feet. The top landing will have two sky parlors, one 10 feet above the other. Three electric elevators will run between the first and top landings. The floor space of the sky parlors will be about 800 square feet each, for the third landing 900, for the second landing 2400, and for the two main landings 10,000 each. The wigwam at the base, 350 feet on each side, will be fitted up with cafés and booths after the different styles and customs of foreign countries, the booths being for the purpose of selling curious articles produced and manufactured in all nations.

The tower will be strung the entire hight with electric lights and with a powerful electric globe in the dome. Perley Hale is the designer and is now preparing the working drawings.

Rules for Exhibitors.

Rules for the government of exhibits in the Department of Machinery have been prepared by Chief L. W. Robinson and submitted to Director-General Davis for approval. The rules show just what exhibitors may and may not do, and will be of interest to the people who have already applied for more space than Chief Robinson has at his disposal. An abstract of the regulations is as follows :

A limited quantity of steam and water power will be furnished for the purpose of exhibiting machinery in operation, the quantity of each to be definitely settled at the time of allotment of space. Any excess will be charged for at a fixed price Demands for such excess must also be settled at the time of allotment of space. Exhibitors will not be allowed to exhibit any kind or class of goods except those specified in the application.

Exhibitors must be manufacturers of machinery and not dealers only.

Exhibitors must provide show cases, shelvings, counters, fittings, countershafts, pulleys, beltings, &c., at their own expense.

Exhibitors are required to furnish the following information and a drawing to the scale of ¼ inch to 1 foot of the plans and distribution of the objects they wish to exhibit. If machinery, actual horse-power required. Cubic feet of steam used per hour at a pressure of 150 pounds. Diameter of steam and water pipes. Diameter of discharge drain pipes. The main shafts will make 120 and 240 revolutions per minute. Dimensions of space required must be given in feet and inches, without including any allowance for passageways. What per cent. of labor performed by females in the production of articles exhibited. Whether the applicant is a producer or manufacturer.

By special arrangements the installation of heavy articles requiring foundation should begin while the building is under construction.

The floor of Machinery Hall will support 250 pounds per square foot. The heaviest single piece received must not weigh more than 30,000 pounds, as facilities will not be provided for handling heavier weights.

The steam pressure supplied will be 150 pounds to the square inch. Those wishing to secure lower pressure may do so by using a reducing valve.

Water pressure will be that due to a head of 225 feet, or a pressure of 98 pounds to the square inch and a head of 40 feet, or a pressure of 175 pounds to the square inch.

The line shafting will be 16 feet from the center of the shaft to the floor.

Driving pulleys are limited to 36 inches in diameter.

Exhibitors of steam and other machinery who desire to offer the exhibits for use by the Exposition company should send their applications as soon as possible.

Such exhibitors may select their own men to operate this machinery. Their wages will be fixed and paid by the Exposition company.

The exposition company will defray the necessary expenses of exhibitors, loaning them machines, tools, &c., for use beyond that which they would have incurred as exhibitors simply, wear and tear excepted.

Fire engines, entered for exhibit, offered and accepted for use, will be properly cared for and furnished with fuel free of expense.

Platforms, counters, ornamental partitions, show cases, &c., will be at the expense of the exhibitors and must not exceed these dimensions: Show cases, 15 feet above the floor; counters, 2 feet 10 inches; platform, 1 foot; partitions, 15 feet.

All exhibits of machinery in motion must be inlosed by a railing 2 feet 6 inches in hight to come inside the space. No signs will be allowed to extend over the passageway and no signs will be allowed made of muslin, linen, canvas or paper.

No fire will be allowed in Machinery Hall except by special permission. Not more than a day's supply of oils or other inflammable substances will be permitted in Machinery Hall, but a suitable place for the storage of these materials will be provided.

No steam or water pipes will be permitted to extend over the passageways, except when specially provided.

Exhibitors not desiring to employ attendants or watchmen may leave their exhibits in the care of the department, which will assume the responsibility of their cleanliness.

Exhibitors' business cards, circulars, and samples may be placed within their space for distribution, but visitors shall not be solicited to receive them.

Committee on Awards Appointed.

President T. W. Palmer on Tuesday, the the 20th inst., appointed the Committee on Awards of the National Commission. This is probably the most important committee of the commission, excepting the Board of Control. It will have charge of the entire matter of awarding premiums and medals, and in this capacity will control the expenditure of several hundred thousand dollars. According to the resolution adopted by the national commission at its last meeting in September, the commission is empowered to employ a secretary at a salary not to exceed $5000 per annum, who is made an officer of the commission. This salary of $5000 will be equal to that paid President Palmer, Secretary Dickinson and Vice-Chairman McKenzie respectively.

The committee is composed of the following 12 commissioners:

B. B. Smalley of Vermont, chairman of the committee, is a member of the Executive, Judiciary and World's Congress Auxiliary Committees.

W. F. King of Iowa is a member of the Executive Committee and the Committee on Science and History.

John Boyd Thacher of New York is a member of the Executive Committee and Committees on Commerce and on World's Congresses. He is an ex-Mayor of Albany.

A. T. Britton of Washington, D. C, is a member of the Executive Committee.

Mark L. McDonald of California is a member of the Executive Committee and the Committee on Mines and Mining.

W. J. Sewell of New Jersey is a member of the Executive and Judiciary committees.

Thomas L. Williams of Tennessee is a member of the Executive and Classification committees.

Lloyd Lowndes of Maryland is chairman of the Committee on Commerce, and is also a member of the Mines and Transportation committees.

A. B. Andrews of North Carolina is the fifth vice president of the National Commission. He is also a member of the Transportation and Finance committees.

A. M. Cochran of Texas is a member of the committees on Agriculture and Transportation.

O. R. Hundley of Alabama is on the Judiciary and Electricity committees.

C. B. Hopkins of Washington is on the committees on Fisheries and Electricity.

To fully carry out the business of the committee, which will comprehend, beside the awarding of medals and cash premiums, the appointment of numerous juries of awards, congress will be asked this winter to make an especial appropriation of approximately $75,000.

The Board of Control instructed President Palmer to call a meeting of the committee not later than November 15 for the purpose of considering and determining what sum of money to be appropriated by Congress will be absolutely needed to discharge the obligations imposed by Congress on the committee. President Palmer said he might call the first meeting of the committee in New York rather than in Chicago.

Scope of the Exposition.

The status and prospects of the World's Columbian Exposition are indicated by the following data concerning exposition buildings, brought up to October 15, 1891, and presented as concisely as possible:

Buildings.	Dimensions in feet.	Area in Acres.	Cost.
Mines and Mining	350 x 700	5 6	$260,000
Manufactures and Liberal Arts	787 x 1687	30.5	1,000,000
Horticulture	250 x 1000	5.8	300,000
Electricity	345 x 700	5.5	375,000
Woman's	200 x 400	1.8	120,000
Transportation	250 x 960	5.5	280,000
Administration	260 x 260	1.6	450,000
Fish and Fisheries	163 x 363	1.4	200,000
Annexes (2)	135 diameter	0.8	
Agriculture	500 x 800	9.2	540,000
Annex	328 x 500	3.8	200,000
Assembly Hall, &c	450 x 500	5.2	
Machinery	500 x 800	9.8	1,200,000
Annex	490 x 551	6.2	
Power house	80 x 600	1.1	
Fine Arts	320 x 500	3.7	500,000
Annexes (2)	120 x 200	1.1	
Forestry	200 x 500	2.3	100,000
Saw Mill	125 x 300	0.9	35,000
Dairy	95 x 200	0.5	30,000
Live Stock (3)	53 x 330	1.3	150,000
Live Stock Sheds		40.0	
Casino	175 x 300	1.2	*150,000
		144 8	$5,890,000
U. S. Government	350 x 420	3.4	400,000
Battle Ship	348 x 69.25	0 2	100,000
Illinois State	160 x 450	1.7	250,000
		150.1	$6,640,000

* Including cost of pier.

The last three are being erected, the first two by the United States Government, and the third by the State of Illinois. The visitor, however, will naturally class them among the great exposition structures. It has been decided that the annexes to the Fine Arts Palace shall be larger than indicated above, but the changes in the plans are not yet made. It is now believed that owing to the great demands for space, more annexes than are named above will be found necessary. All of these annexes will be scarcely less imposing and architecturally beautiful than the main buildings themselves. The live stock sheds, which will cover an immense area, as indicated, are to be constructed as inexpensively as possible without marring the general architectural effect. There will be several exposition buildings in addition to those named, but the plans for them are not yet completed. Among them will be a Music Building and a Press Building. The total cost of the exposition structures is estimated by the Grounds and Buildings Committee at $7,295,000.

It cannot be stated yet how many State buildings and buildings of foreign nations there will be in Jackson Park, but it is safe to say that the whole number will be fully 75. These, particularly those of foreign nations, will show a great diversity of architecture.

The Exposition Company have very large expenditures to meet in addition to the cost of the buildings. In fact, the latter does not constitute one-half of the total amount necessary to carry through the exposition enterprise. In a recent report made by the Grounds and Buildings Committee, the following estimates of such expenses were given:

Grading, filling, &c	$450,000
Landscape gardening	323,490
Viaducts and bridges	125,000
Piers	70,000
Waterway improvements	225,000
Railways	500,000
Steam plant	800,000
Electricity	1,500,000
Statuary on buildings	100,000
Vases, lamps and posts	50,000
Seating	8,000
Water supply, sewerage, &c	600,000
Improvement in lake front	200,000
World's Congress auxiliary	200,000
Construction department expenses	520,000
Organization and administration	3,308,563
Operating expenses	1,550,000
	$10,530,053

Adding to this the amount estimated to be necessary for buildings ($7,295,000) and the grand total sum to be expended by the Exposition Company stands at $17,825,053. All of the great buildings have been contracted for and are under construction. On several the work is proceeding night and day, and all are being pushed to completion by large forces of workmen. Insurance is placed and increased on the buildings as their construction proceeds. It is the intention to carry insurance aggregating $300,000,000 on the buildings and exhibits.

In view of the showing given above, a statement of the exposition's finances is interesting in this connection.

RESOURCES.

Stock subscriptions	$5,608,110
City of Chicago bonds	5,000,000
Prospective gate receipts	10,000,000
Concessions and privileges	1,500,0 0
Salvage	1,000,000
Interests on deposits	27,035
Total	$23,135,145

To the resources will be added future interest on bank deposits and future subscriptions to stock. Subscriptions are coming in daily, and the amount which will thus be realized is certain to be large, though how much it will be cannot, of course, be estimated now even approximately. Of the subscriptions already received 60 per cent. has been called for, and considerably more than $3,000,000 has been paid in. The number of subscribers is over 30,000. Death, impoverishment, &c., have caused thus far a delinquency in collections of between 7 and 8 per cent. of the whole amount due. This is much less than was anticipated. Quite a number of subscribers have anticipated the calls and have paid up in full. The $5,000,000 from city bonds is certain to be realized in full, as Chicago's credit is excellent. The gate receipts, concessions and privileges and salvage are necessarily prospective, and the amounts given are of course estimates. The total disbursements to October 15, for all purposes, have been $1,459,080.

Electric Fireworks for the Fair.

Electric fireworks for the fair are receiving prominent consideration at the hands of the Ways and Means Committee. There is one scheme which has won the admiration of the committee, and it is the plan of Eugene and Paul Champion of Neuilly-sur-Seine, France. It is a magnificent one, and comprehends the reproduction night after night, if desired, of the same beautiful pieces. It will require a space of from 1000 to 2400 square meters, and will call for at least 280 horse-power to keep the lights going. It is designed to produce something 80 times larger and grander than the electric fountain at the Paris Exposition. The projectors of the scheme offer to put in the plant themselves for a specified sum or a certain guarantee, or they will send expert engineers to Chicago to superintend the construction of the plant at the exposition. Then, they say, they will take charge of it and run it, asking merely a certain royalty on the use of the patents involved.

Brevities.

A concession has been granted to the W. L. Libby & Son Company of Toledo, Ohio, to erect and operate on the grounds a glass furnace. They will show the process of manufacturing all sorts of pressed and ground glassware.

The movable sidewalk was tested at the exposition grounds the past week, and is reported to have worked satisfactorily. The trial track is capable of transporting past a given point 40,000 people per hour.

It has been practically decided that the proposed National Commission to Southern Europe and Northern Africa will sail December 15. At that time most of the legislative bodies of most of the countries to be visited will be in session. Speculation now has it that the members of the proposed commission will be Vice-President Bryan, Walter Fearn, Chief of the Department of Foreign Affairs, and John Boyd Thacher of New York.

Secretary J. A. Hornsby of the Department of Electricity, who is now in Europe, writes to Chief Barrett that German electricians have promised to make a greater electrical display at the World's Fair than they have shown at the electrical exposition recently held at Frankfort. According to Mr. Hornsby the Ganz people of Vienna want to connect St. Louis with Chicago during the World's Fair by their rapid transit electric railway. They think they will be able to run a car every half hour and cover the distance between the exposition and St. Louis in three hours.

The exposition buildings will be dedicated on October 12, 1892, with imposing ceremonies, in which the President of the United States, the Governors of all the States, the military and militia and many distinguished individuals are expected to participate.

The exposition will open its doors to the public on May 1, 1893, and close them October 30 of the same year.

The proceedings of the American Forestry Association just issued contain the report of the summer meeting held at Quebec in September, 1890, and of the ninth annual meeting, at Washington, in December of the same year.

The Harvey Patents.

Some details of interest are given in the patents granted lately to H. A. Harvey of Orange, N. J., on the manufacture of armor plate and guns. The specifications are accompanied by drawings showing the furnace in which the operation is carried out. The future must tell whether Mr. Harvey can accomplish regularly and uniformly what he has undoubtedly succeeded in doing in isolated cases. Mr. Harvey's cementation process is described as follows:

The armor plate having been formed of the desired size and shape from a comparatively low steel, such as Bessemer steel or open-hearth steel containing, say, 0.10 per cent. to 0.35 per cent. of carbon, is laid, preferably flatwise, upon a bed of finely-powdered dry clay or sand, deposited upon the bottom of a fire brick cell or compartment erected within the heating chamber of a suitable furnace. The plate may be so imbedded that its upper surface is in the same plane with the upper surface of those portions of the bed of clay or sand which adjoin the sides and ends of the plate, or the plate may, if desired, be allowed to project to a greater or less distance above the surface of the clay or sand. In either case the treating compartment is then partially filled up with granular carbonaceous material, which, having been rammed down upon the plate, is covered with a stratum of sand, upon which there is laid a covering of heavy fire bricks. The furnace is then raised to an intense heat, which is kept up for such a period of time as may be required for the absorption by the metal adjoining the upper surface of the plate of, say, an additional 1 per cent. (more or less) of carbon, or, in other words, the quantity of carbon, in addition to that originally present, which may be necessary to enable the said metal to acquire the capacity of hardening to the desired degree. The temperature of the heating chamber outside of the treating compartment is brought up to a hight equal to or above that required to melt cast iron, and is kept up for a greater or less length of time, according to the depth of the stratum of steel which it is intended to charge with an excess of carbon. This period, however, will, of course, vary according to the efficiency of the furnace.

The degrees of efficiency possessed by different furnaces can only be satisfactorily ascertained by actual trial. When ascertained, the reproduction of given results merely requires the re-establishment of the conditions as to time and temperature under which said results have been previously observed to be obtained. This involves merely the maintenance of the furnace at a heat sufficient to melt cast iron for the period which by previous observation has been ascertained to be the period required for adding to the tenacity of the steel and for the supercarburization of the plate to the prescribed extent and depth. For example, a plate, say, 10½ inches in thickness, composed of a comparatively low steel, containing, say 0.35 per cent. of carbon, may be charged with additional quantities of carbon, gradually varying in amount from, say, 0.10 per cent. at a depth of 3 inches beneath the surface of the exposed side of the plate to 1 per cent. at the surface thereof, by a continuance of the treatment for a period of, say, 120 hours after the furnace has been raised to the required temperature.

The statement that the heat at which the furnace is maintained is sufficient to melt cast iron is to be regarded as approximate merely. The more intense the heat the better, and while it will, of course, be understood that the longer the treatment is continued the greater will be the depth to which the carbon penetrates beneath the surface against which the carbonaceous material is packed, it is also to be remarked that the penetration of the carbon is greatly facilitated by the continuous firm compression of the carbonaceous material against the plate. As a general rule, the thicker the armor plate the greater will be the permissible depth of supercarburization. A 10½-inch plate and a depth of supercarburization of 3 inches are herein referred to merely for the purpose of illustration.

After the conclusion of the carburizing treatment the plate is taken out of the furnace, and without removal of the carbonaceous material from its surface is allowed to cool down to the proper temperature for chilling. During the cooling operation the carbonaceous material protects the hot supercarburized surface from the air, and thus prevents the formation of scale, which, if present, would interfere with the subsequent hardening of the metal beneath it. The carbonaceous material, however, may without injurious consequences be temporarily removed from and quickly replaced upon small portions of the supercarburized surface for the purpose of exposing them for observation. When it is seen that the supercarburized surface is so far cooled down as to have a dull cherry-red color, the carbonaceous material is quickly removed, and the plate is then chilled by being sprayed with torrents of cold fluid or by being submerged and kept in motion until cold in a large body of cooling fluid—as, for example, a more or less rapidly running stream or river of fresh water or a tidal current of salt water. The exercise of this precaution insures the subsequent uniform hardening of the supercarburized surface of the plate.

San Francisco News.

At the present time the formation of the Merchants' Traffic Association is absorbing public attention, and beside it, from a business point of view, everything else pales its ineffectual fires. The chairman of that association, who was selected yesterday—Jas. B. Stetson—is one of the leading men in the iron, steel, tin and tinplate trade, and has been a man of note for at least a quarter of a century. He is a member of the firm of Holbrook, Merrill & Stetson, and is prominent not alone in private life, but in various important enterprises as well. He will have an onerous task. It may involve a struggle with the Southern Pacific, though probably not. The aims of the association are to obtain fair rates for California products and manufactures as far East at least as Omaha. That territory and north to Alaska and south to Cape Horn the merchants of San Francisco regard as their territory by right. San Francisco should supply all this vast region with iron, steel, nails, hardware—everything in the shape of metals—but it does not. It is confined almost to the limits of California. Merchants in Chicago, St. Louis, Kansas City and elsewhere can ship goods much more cheaply to Salt Lake, Denver, Boise City and Helena than can those of San Francisco, or indeed, for the matter of that, any other Pacific Coast point. Bar iron or machinery, bolts, nuts, nails or anything in these lines manufactured here cannot possibly be shipped to these points and sold. Even Baltimore can take canned fruits and ship them to these points more cheaply then can San Francisco canners. Nay, it is said to be cheaper to send goods to Baltimore and ship them back again than to attempt to ship direct.

The Traffic Association aspires to put an end to this state of things and to secure equable rates. It is proposed to obtain J. B. Leeds, a Western railroad man, as manager. The Southern Pacific and San Francisco have never been on the very best of terms. When its projectors were struggling in the slough of despond trying to get their road built and funds for that purpose, San Francisco was apathetic, and some of our leading papers opposed aid. Hence the directors never considered themselves under any peculiar obligations to the Golden City and have not gone out of their way to study its real interests. With such a state of things nothing but strained relations were possible. This city, however, cannot be allowed, commercially speaking, to starve to death on account of former errors. Our merchants and manufacturers will have to be up and doing, be united and confident and the victory is theirs, either through surrender on the part of the associated roads, because I do not fall into the common mistake of making the Southern Pacific responsible for everything, or by extending aid to build a new road. Ten millions would bring a road this way, and one competing road would invite others. The hardware and iron men are strongly represented in the new movement. They are mostly wealthy and prosperous; their money and their advice will be of material weight in the counsels of the Traffic Association of California. Among the names propoposed as members of the executive committee we find those of B. F. Dunham, Geo. C. Hawley, A. S. Hallidie, all leading men in the hardware and iron trade.

During the week there has been quite a good business in progress. From the general improvement we may perhaps still except nails, which are dull and demoralized. The area of territory now covered by the hardware trade of San Francisco includes this State and a great deal of Oregon, Washington and Arizona, besides Western Mexico, Central America, the Hawaiian Islands, and the Pacific Islands, with a little to Australia, China and Japan. Small lots can be bought better here than in the East, so that this brings us the trade of a very many small establishments outside these limits where a thousand dollars spent in San Francisco will buy in a greater variety of articles and on better terms as to time of payment than can be had in Eastern cities. Imports of pig iron during the past two weeks have been 300 tons per Senegal. We have also been in receipt of a good deal of steel plates and other iron ware by sea. There has been a reduction in the spot price of tin plate, which is now quotable $6.60 to $6.70. To arrive, however, the quotation is unchanged, $6.15. Pig tin is dull at 21 cents.

The Los Angeles *Times* claims that in this State and within 175 miles of Los Angles there exists the finest body of Bessemer ore in the United States—the best in quality and the largest in extent. It is near the line of the Atlantic and Pacific in the vicinity of Newberry, the first station east of Daggett. It is the property of the California Iron and Steel Company. Engineers are surveying the ground and the way for a narrow-gauge road from the mines to Newberry. Two blast furnaces will be put up on the railroad at Newberry and extensive works at other points in California. The company are composed of Pittsburgh and Western men.

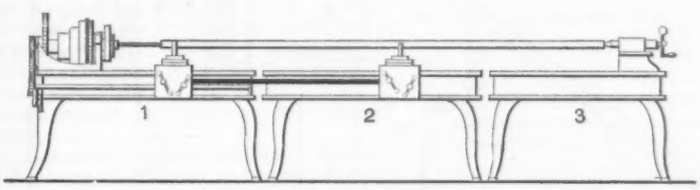
The import movement by rail continues lively. For the past two weeks we have had 30 cars of iron, 17 cars of steel, 15 cars of hardware, 20 of machinery, 5 of pipes, 8 of stoves, 1 of plates, 1 of rails, 6 of wire, 3 of ranges, 1 of castings, 1 of springs, 4 of agricultural implements; total, 112 cars; 770 pounds copper, 4691 pounds spelter.

Captain Charles H. Nelson, who recently captained a vessel in the China trade, has given an order to the Harrison Loring Iron Works, at City Point, for the construction of a steel bark of 1398 tons. Several well known Boston merchants are interested in the venture.

Random Shop Notes.

Cutting a Lead Screw.

John Tregoning, superintendent of the Nicholson & Waterman Works, Providence, R. I., recently did an unusual job of screw cutting, which clearly illustrated that even in these days of perfected appliances considerable wit and ingenuity find place in the ordinary machine shop. The task was to cut a lead screw for a lathe, the length being 30 feet, diameter 3 inches, pitch 2, and the thread square. It was intended to go on a lathe having a swing of 50 inches and a length of 34 feet. The work of cutting was done by means of three small lathes, arranged end to end, as shown in the drawing, the distance between the tail stock of the third lathe and the driving spindle of the first lathe being sufficient to take in the screw. Steady rests were, of course, provided where needed. The first cut was made with the rod held between the tail stock and an extension of the head stock spindle, this arrangement being adopted in order to carry the thread over the gap between the two lathes 1 and 2. The carriage of the second lathe was then rigidly connected with the carriage of the first lathe, and the thread was cut by the second carriage thus driven from the first. The spindle extension was then removed and the bar held between the spindle and the moved up tail stock of the third lathe and the screw continued to the end of the bar by means of the carriage on the first lathe. The bar was then reversed and the cutting continued



CUTTING A LEAD SCREW.

on the opposite part. The work thus produced was first-class in every respect, no perceptible difference being found in any part of the thread. The job was quickly performed and was much cheaper than it would have been to have sent the bar to a shop having facilities for cutting this thread with one machine.

Facing Abutting Ends of Lathe Bed.

Another job was required which taxed the facilities at hand, and yet which showed that it was possible to do work with what we might call "make-shift" apparatus. The bed for the lathe was cast in two pieces and after planing it became necessary to plane the abutting ends. One-half was taken and placed at right angles to the bed of a planing machine, the bed of which was known to be level. To get the lathe bed in the same plane with the table of the planer was a simple operation, a more difficult one being to get the lathe bed precisely at right angles to the planer. Here was brought in the old problem of erecting a perpendicular on a straight line, the planer bed being the straight line. Accurately erecting this perpendicular, then bringing the lathe bed to coincide with it, was the final and delicate operation. When this had been done a knee was bolted to the planer bed and on the upper part of this knee or bracket was carried a tool carriage. The planer was then set in motion across the end of the lathe bed and the tool fed down by hand. The other half of the lathe bed was treated in the same way. When the two parts were finally bolted together it was found that the adjustment had been so accurate and the cutting so clean that there was not a variation of $\frac{1}{32}$ inch between the center and either end of the bed.

Placing Vise Benches.

We recently saw in the new shop of Bement, Miles & Co. of Philadelphia an admirable arrangement overcoming the difficulties often presented by the bench vise question. Where to put the vise benches where they will be convenient and at the same time out of the way of machines is a question which taxes the ingenuity of every superintendent. Place them in one position, thinking they are permanently located, and the first thing it becomes necessary to move them in order to make place for an additional tool. Here the benches are constructed on frames forming the legs, the tops being of heavy hard wood, to which the vises are bolted. These are placed in the shop wherever most convenient both for the man and work in hand and the regular machines. Whenever it becomes necessary to re-arrange for the reception of a new machine the benches are lifted by cranes and carried to a new location. The plan has been found to work well, give satisfaction and to fully overcome all difficulties.

The Forge Masters.

The second annual meeting of the United Forge Masters' Association was held at the Imperial Hotel, New York City, October 14 and 15. The officers of the association are: Capt. L. M. Coe of Cleveland, president; W. S. Sizer of Buffalo, vice-president; F. L. Alcott of Cleveland, commissioner. Executive Committee are Joseph Howard of Buffalo, James Johnston of Paterson, N. J.; W. F. Pinkham of New York. The association has been in existence two years, and is composed of the largest steam forges in the country. President Coe read his address, as follows:

PRESIDENT COE'S ADDRESS.

This association was originated both for private security and the benefit of the public; we believed the time had come when the greatest perfection was demanded in our products, and that the public interests would be better secured by uniformity of excellence, stability in prices, the avoidance of undue competition and clashing of interests among ourselves, or such sharp rivalry to secure contracts by lowering prices, which in the end would only result in the manufacture of inferior quality and the lowering of the standard of American production.

It was for these reasons we have continued our labors until the present time. For future success we must have for our motto: Unity of action, integrity of purpose, absolute fidelity to the rules and cardinal principles of our association. Without confidence there can be no trust; without trust the ties that bind us together are but ropes of sand. Our union to be successful must be absolutely honorable, and its aim and objects must command the sympathy of us all. From the report of our commissioner it appears that by accident, misconception or design on the part of some of our number there has been a departure from the principles and rules which are supposed to lie at the basis of our bond of union. This should not be; we are bound by good fellowship and good faith to abide by our agreements, and any departure from this basis causes doubt, distrust, uncertainty and dissatisfaction. Unless controlled and corrected it must in the end produce such serious apprehensions as to lead to the gravest consequences.

It is a law of political economy that the volume of business cannot be safely increased beyond the healthy demands of the country; hence the cutting of prices insures no more work, does not, in fact, add a pound of iron or steel manufactured product beyond the real wants of trade. Its only effect is to secure some particular job for some particular locality or some particular forge. If certain establishments, in their eagerness for employment and to secure orders, cut the prices, either directly or by commission or drawbacks, such action defeats and destroys the beneficial use of this great association. It strikes a deadly blow at its aims and objects. It inflicts, of course, direct injury upon those members who maintain absolute integrity, our bond of union, and leaves the faithful, genuinely honest member of our body to suffer injustice at the hands of his brother associate. From the most selfish individual point of view there is no wisdom in such action. The national demand of trade and the splendid condition of the country call for no diminution or cutting of prices, or reducing the price of labor. It is our pride that we have the best-paid laborers in the world, and I hope this state of things will long continue.

But I will not press this line of thought. You will all understand how keenly I desire that this association shall stand foremost among the great moving factors of our national powers and usefulness. Never since 1879 could we meet under more auspicious circumstances. The country at this time is literally an earthly Canaan, a land flowing with milk and honey. While in foreign lands there is want, distress, apprehension and suffering, here flowing plenty is seen on every hand. The yellow autumn sun never look down upon a more golden harvest. Waiting for distribution lie 1,990,000,000 bushels of corn, and 650,000,000 bushels of wheat; in money value, sufficient to pay the entire national debt. Oats, hay, fruits and crops of every kind are found in lavish profusion. Every elevator groans under the weight of its burden. The vast fleet of steam vessels upon the unsalted seas are pushed to the utmost of their capacity to carry their freight of coal, iron and grains. The gold we sent abroad a few months ago simply crossed the ocean for a healthy journey, and is now rapidly returning. Stocks and securities are advancing; the railroads cannot furnish facilities for the pressing demand upon their resources; labor is fully employed, and we, as American citizens, have reason to rejoice at the present position the United States occupies in the family of nations, the richest and most prosperous in all the globe. With this prosperity staring us in the face, with the future spreading its golden promises before us, it seems to me that this is the exact moment for us to stand side by side in the enjoyment of the certain coming prosperity; and to remember that "in union there is strength," in division, weakness; that while we are loyal to our country and true to ourselves, and true to this association, its aims, objects and interests, we can aid in elevating the honor of our country and promote its welfare, by assisting to maintain its present exalted position as the foremost manufacturing nation on which the sun now shines.

After the reading of the address the reports of the different committees were read. The present officers were re-elected for the ensuing year. Business of interest to the association only was transacted, and the meeting was adjourned to meet at the call of the president in New York City.

Western Rates on Structural Material.—The Freight Committee of the Central Traffic Association, at its last meeting in Chicago, decided to reduce the rates on structural iron and steel and bridge material, for the reason that the trunk lines had been making reduced rates on those articles from Eastern points. Learning of the action taken by the Central Traffic Association roads the trunk lines agreed to withdraw the commodity rates on the above-named articles from Edgemoor, Pencoyd and Steelton, to take effect November 3, thus restoring them to the tariff basis under official classification. The application for reduced rates from Athens, Elmira and Patterson were also withdrawn. Owing to the above action by the trunk lines Chairman Blanchard asked the members of the Central Traffic Association to vote on a proposition to withdraw the reduced rates on the above-named articles, and as all the voters were in favor of the proposition, notice was given on the 21st that the rates should be restored to the basis of official classification, to take effect November 3.

The Forging Press.*

BY W. D. ALLEN.

In the production of heavy forgings from cast ingots of mild steel it is essential that the mass of metal should be operated on as equally as possible throughout its entire thickness. When employing a steam hammer for this purpose it has been found that the external surface of the ingot absorbs a large proportion of the sudden impact of the blow, and that a comparatively small effect only is produced on the central portions of the ingot, owing to the resistance offered by the *vis inertia* of the mass to the rapid motion of the falling hammer—a disadvantage that is entirely overcome by the slow, though powerful, compression of the hydraulic forging press, which appears destined to supersede the steam hammer for the production of massive steel forgings.

The press now brought under notice was designed to act more or less automatically, or self-acting, and to insure the perfect parallelism both of flat or square masses and of round shafts without being dependent for their truth on the skill of the operator. The forging press about to be described has been erected and in operation for some time. It works most satisfactorily, and, on the whole, is found to be a most efficient and useful tool.

In this press the force pump and the large or main cylinder of the press are in direct and constant communication. There are no intermediate valves of any kind, nor has the pump any clack valves, but it simply forces its cylinder full of water direct into the cylinder of the press, and receives the same water, as it were, back again on the return stroke Thus, when both cylinders and the pipe connecting them are full, the large ram of the press rises and falls simultaneously with each stroke of the pump, keeping up a continuous oscillating motion, the ram, of course, traveling the shorter distance, owing to the larger capacity of the press cylinder.

The top and bottom portions of the framing A A are alike and from the same pattern, each consisting of two castings, held by bolts and steel hoops, as shown. The main columns B B are hollow ; they have annular projections or rings C C cast at each end, which fit into corresponding recesses cast in the top and bottom frame pieces. The large press cylinder D is fitted and held in the top frame; the anvil block rests in the bottom frame. Weldless steel hoops are shrunk on to the cylinder to give additional strength. E is the main ram. It has a strong shank to it, which passes through the top of the cylinder, acting as a guide. F is a steam cylinder with piston, the piston rod of which passes through the gland at the bottom of the cylinder and is attached to the shank of the ram. G is a crosshead working in guides, thus preventing the ram from turning round.

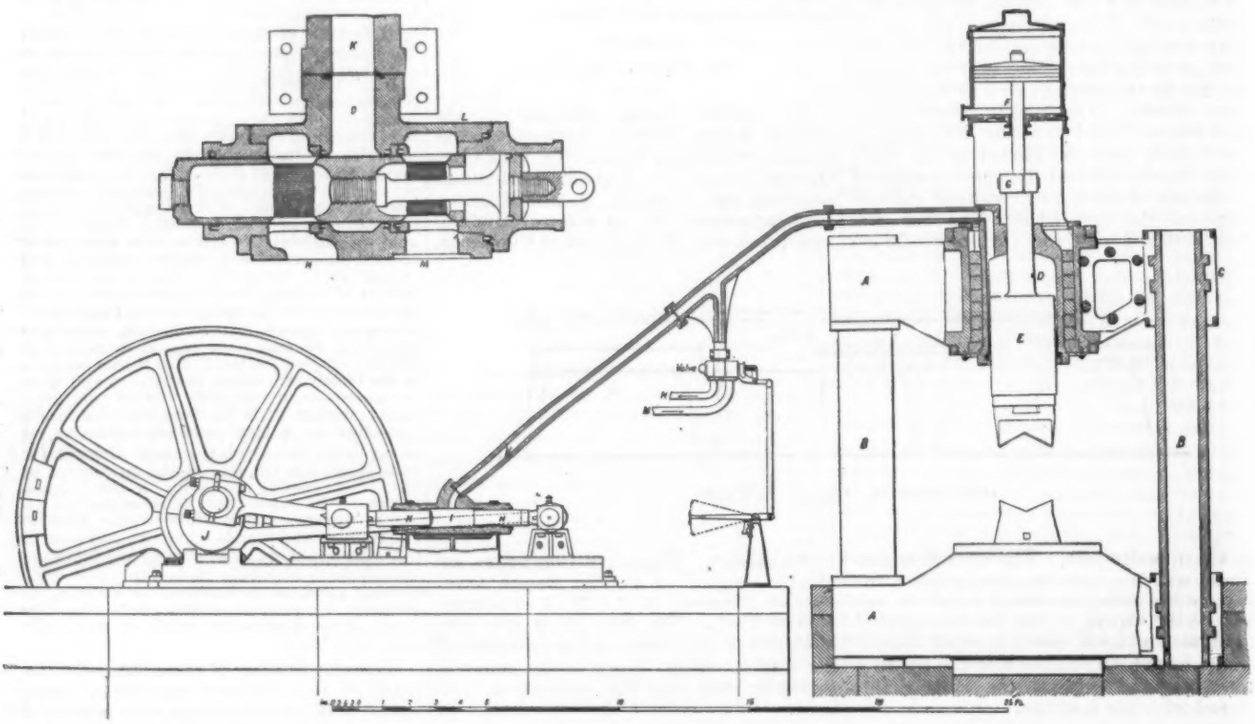
The force pumps may perhaps be appropriately termed "duplex," the ends or faces of the two plungers H H advancing and receding to and from each other simultaneously at each stroke. They work into the opposite ends of the pump cylinder I. This cylinder has no bottom, and becomes simply a strong tube. The two plungers are worked by the three-throw crank J, the two side throws of which are on exactly opposite centers to the middle throw. The two side throws give motion to the plunger furthest from the crank, in which case the strain exerted is a pull, while the middle throw gives motion to the plunger nearest to the crank, and the strain is a thrust or push. By this arrangement it will be observed that an absolute balance of force is obtained, and all strains between the crank and pump are avoided.

As before observed, a free communication is at all times maintained between the pump cylinder and the press cylinder. This is done through the pipe K, and when all are full of water and the engine working, an ascending and descending motion is imparted to the press ram at each revolution of the crank, the descending motion being given by the press plungers H H advancing toward each other and forcing the contents of the pump cylinder into the press cylinder, the ascending motion taking place by means of the steam piston, which, on the return stroke, raises the ram and forces the water back on to the pump plungers as they recede from each other; so that as long as there is no waste of water by leakage, and its quantity is not increased or decreased, the press ram will continue to oscillate at the same distance from the anvil, and could only operate on work of that exact size. The ram has, therefore, to be raised or lowered to suit the various requirement of work in hand, and to effect this a source of supply of water under a pressure of about 250 pounds has to be provided, which, when admitted into the press cylinder, has sufficient force to overcome the power of the steam in the steam cylinder, sending the steam back into the boilers. By this means the ram is rapidly brought down any required distance. On the other hand, the power of the steam immediately raises the ram upon the water being allowed to escape.

The valve used for the rapid admission and escape of water becomes, therefore, rather an important feature. It consists of a cylindrical casing, having a hollow cylindrical valve or plunger, working endwise through hydraulic leathers; at each end of this valve or plunger very fine slits are sawn lengthwise through its sides or walls. The principle of the valve is, the allowing of the admission and escape of water through the fine slits, by moving the valve endwise until the fine splits pass the hydraulic leather; the set of slits at one end of the valve being for the admission of water, and those at the other for the escape.

L is the casing bored through and fitted with hydraulic leathers. M is the inlet, N the outlet and O a passage into the pipe K. The valve or plunger is fitted pretty freely into the casing, and is capable of being easily moved endwise. It is hollow with a solid division in the center, the hollow forming a sort of cup on each side of the solid part, and through the side walls of these cups the fine slits are cut.

When it is desired to bring the press ram down the valve is moved endwise to the left until the fine slits pass the hydraulic leather, and a passage is thereby opened from the inlet M through the slits, and water is admitted into the passage O and then on to the pipe K, and the ram at



HYDRAULIC FORGING PRESS AT BESSEMER COMPANY'S WORKS, SHEFFIELD.

* Read before the Iron and Steel Institute.

once descends. When it is desired to raise the ram the valve is moved to the right, and the water passes out through the other set of slots and away by the outlet N, and the ram at once ascends by action of the steam. It should be observed that at the time the slits pass the leather the low pressure only is in operation, and at the moment of impact of the ram upon the work the valve is always in its neutral position, the position shown in the diagram, the plain body of the central portion of the valve, with a cup leather on each side, being all that is exposed to the great pressure.

The proper time for admission of additional water is when the pump plungers are receding from each other, and the valve should always be put in its neutral position before the ram face comes upon the work. This arrangement of valve is found to operate most successfully, and the change of position of the ram is effected as quickly as is necessary or desirable. The valve being in perfect equilibrium, is most easily worked by a handle, brought to a convenient position for the operator to see the work in hand. The arm may be raised or lowered for its entire range in a very few seconds. It can be brought down to the greatest nicety a little lower each stroke, enabling forgings to be made correct to dimensions, or in case of any sudden occurrence, when it is found undesirable for the impending pressure to take place, a stroke can instantly be averted by moving the valve to the right, although the face may even be in contact with the work. The ram, in fact, is perfectly under control, and almost as lively as the tup of a hammer. An accumulated power is obtained by two heavy fly wheels on the crank shaft of the pumps, the momentum of which imparts very great force at the moment of impact of the ram, at which time the cranks approach and turn their centers.

As a security against accident, and a precaution against this force becoming too great, a system of safety valve has been devised (although not shown in the diagrams). It consists simply of a steam cylinder and piston, the piston rod of which works into a small hydraulic cylinder that is in constant connection with the pipe K. Steam is admitted into the steam cylinder at the opposite end to that of the piston rod, and when the hydraulic pressure on the end of the piston rod becomes sufficient, it forces the steam back into the boilers. Thus, if the steam piston is 60 inches in diameter, and the piston rod 6 inches in diameter, and the pressure of steam 50 pounds per circular inch, a hydraulic pressure on the end of the piston rod of 5000 pounds per circular inch will be an equivalent, and a pressure exceeding that will force the steam back into the boilers, and relief for the water will thereby be obtained.

The press ram makes a stroke of $2\frac{7}{8}$ inches, and its diameter is 30 inches, so that at a pressure of 3 tons per square inch (deducting the area of the shank) we have a power of 1700 tons. But, of course, no pressure is developed until resistance takes place; hence no power is lost or consumed (except what is lost by friction) until the ram face comes into actual contact with the work, and then sufficient pressure only is developed and consumed to do the work. The press was fitted up by W. & J. Galloway & Sons of Manchester, and with the exception of the steam cylinder it is constructed entirely of steel. The form and strength of all the parts have proved to be capable of sustaining the sudden and great strains to which they are subjected, and no springing or flinching takes place, the ram always descending to the same spot, whether it has to press 2 inches into an ingot or has nothing to do. This has been found manifest in rounding up, for when the ram is once brought down to the right point to give the required diameter the work has only to be regularly turned round. Of course all has to be dead tight, but there are no joints except cupped leather ones, and very few of those.

THE WEEK.

Chicago is struggling for a full share of South American trade. She has two companies in the field, the Pan-American Transportation Company and the Honduras Company, the latter with a capital of $3,500,000, and which has for its purpose to induce Americans to settle in Honduras by furnishing both transportation and supplies. The American Consul at Ruatan is said to be engaged in a similar enterprise. An agent of the Pan-American Company, Col. J. B. Clark of Chicago, states that liberal subscriptions have been obtained for a line of steamships between Galveston and Central and South American ports and that bids will be made for the contract of carrying the mails to those countries provided for under the act of the last Congress. The routes from Galveston are to Brazil, Colon and Venezuela.

China leads all foreign countries as a market for American manufactured cotton, and notwithstanding international differences her demand is increasing year by year. The total exports for the expired eight months of the calendar year amount to 131,196,265 yards, against 80,814,120 yards last year, an increase of 51,382,145 yards, or over 63 per cent. Values compare $8,640,583 against $5,578,841, an increase of $3,061,742, or nearly 55 per cent. The average value per yard of this year's exports is 6.58 cents, or 0.32 cent per yard below last year, when the average was 6.90 cents per yard. In the distribution of exports an examination of the figures shows that nearly the entire increase of 51,000,000 yards is due to the larger demand in China. Brazil has fallen off nearly 3,000,000 yards, despite reciprocal trade, and the West India trade has fallen off still more. Contrary to expectations, exports to China via Vancouver are much less than those of a year ago.

The 72 lads comprising the "first set of apprentices" of the Williamson Free School of Mechanical Trades were introduced to the institution on the 20th inst. The formal opening will not be held, however, until October 31. After six months the boys will be assigned to their trades. It is intended to erect additional buildings in the future, so as to accommodate from 300 to 350 apprentices.

By the decision of Chancellor McGill of New Jersey in the celebrated will case of Hezekiah B. Smith, the Burlington County manufacturer, there will be established a school for young mechanics at Smithville, according to the provisions of the will.

Bolivia with improved transportation will send large quantities of coffee and rubber to the seaboard.

The Attorney-General of Kansas has issued a mandamus to compel the Union Pacific Railroad to relay the Kansas branch with steel rails, agreeably to the orders of the State Railroad Commissioners.

Statistics of the exports from Mexico during the fiscal year ended June 30 have just been published. They show a healthy increase of foreign trade, for in merchandise exports there has been a gain of more than $1,000,000 over the previous year, and an increase of more than $8,500,000 over the average for five years past. Noteworthy gains have been made in coffee, tobacco, fruits, lead, zacaton, silver ore, and gold bullion. The United States is increasing its purchases of Mexican products, taking nearly $2,000,000 worth more in the last fiscal year than in the previous year. The proportion as regards Mexico's exports stands: United States, 71 per cent.; England, 17 per cent.; France, 5.7 per cent.; Germany, 4.4 per cent. Germany is taking ore for smelting, which formerly went to Kansas City and Denver.

Work on the proposed tunnel under the East River from New York to Long Island City will soon commence, it is said. The right of way into Long Island City having been granted, there is now believed to be no reason for further delay. The tunnel will cost $10,000,000 and be completed within three years. Whether it will contain three or four tracks has not been decided. Connections with the tunnel will be made at the Grand Central Station and at the stations on the elevated roads on Forty-second street by means of elevators. An arrangement has been made, it is understood, between the New York and Long Island and the New York Central roads, which will, in effect, give the Central right of way from its tracks on Eleventh avenue to Long Island City through the tunnel when constructed.

If the Pennsylvania Railroad completes its negotiations with the Northern Pacific it will create a system of 13,000 miles, securing a route from ocean to ocean.

The tall tower of the Madison Square Garden is built on solid rock and from the ground to the electric light on the forehead of Diana, which surmounts a frame work of steel and iron, is 341 feet. With the exception of the Washington Monument it affords the loftiest outlook in the country.

Galveston is agitated on the subject of a proposed bridge from the city to the main land. The difficulty is the cost of the structure.

The importance of lake commerce is indicated by the fact that an accident at the Sault Ste. Marie Canal detained 130 vessels, representing $18,000,000, including their cargoes, until a ship channel 700 feet in length could be cut around the obstruction.

Natal, South Africa, will soon have a fine harbor, extensive works being in progress. Last year 33 vessels entered from the United States.

A Pittsburgh boat builder, referring to the fact that an Iowa firm has obtained a contract for a torpedo boat, complains that Eastern and Western builders can buy their material cheaper, although Pittsburgh is right in the iron center.

Within the next two months at least three of the new naval vessels now building will be launched, cruiser No. 10 about November 1, from the Columbian Iron Works, Baltimore; the cruiser Raleigh, from the Norfolk Navy Yard, later in the month, and the armored cruiser New York, from the yard of Cramp & Sons, Philadelphia, December 1. At least half a dozen more will follow during the winter and spring, including the battle ship Texas, at Norfolk.

A new feature is the building of American cars for the equipment of an English road. A train of six cars was purchased complete for service between London and Dover. The latest plan is to build them in sections and put the parts together on reaching their destination.

Russia is not alone in wanting money. Spain wants $20,000,000.

It is intimated from Washington that Chili must make speedy reparation for injuries suffered by American subjects, or take the consequences.

The Standard Oil Company have determined to make Meadow Lands, near Wash-

ington, Pa., the permanent storage station for the southwest oil fields. Forty or 50 tanks will now be built as fast as possible. and when these are completed the company will have a storage capacity of 2,000,000 barrels at this point.

Secretary of the Treasurer Foster, in a speech in Ohio last week, expressed much delight with reciprocity. He said: "It is an established feature of the Government. We have already concluded reciprocity treaties with Germany, Spain, Brazil and several Central American countries. Before long we will have them with France, Austria, Italy and other great powers. I don't know as we will be able to do much with the Argentine Republic, for it produces about the same things as we do in this country.

Farmers' Alliance discussions are rife in Kansas, Missouri, Indiana and Illinois. Stupendous projects are under consideration, with the object of controlling the crops, establishing co-operative stores, &c., some of them quite impracticable. At Salina, Kan., last week, a State convention was held which approved by an overwhelming vote the scheme to make the Kansas Alliance a part of the National Union Company of New York. This is a scheme for establishing co-operative stores in every county in the State where the sub-alliances are willing to patronize it. The only other State in the Union where the scheme has been approved is South Dakota. A general manager will be elected by the National Executive Council, who will appoint local agents and make all the purchases. All goods will be bought direct from the manufacturers and distributed from Kansas City. The Alliance also proposes to control the grain held among its membership.

Oats are in demand for export on a large scale. Nearly 2,500,000 bushels have been already engaged for shipment from Atlantic ports.

Telescopic steel masts or rods are to be used in lighting the public squares in Brussels, Belgium. The object of this system is to preserve the beauties of the parks in the daytime.

The trouble among the locomotive engineers at St. Louis was settled last week through the intervention of Chief Arthur and Grand Master E. P. Sargent, after mutual concessions. Chief Arthur said that aside from wages the alleged grievances were generally magnified. "There are always two sides to a question, and when men discuss and think over a grievance it appears to become enormous."

A rebellion in Paraguay follows a similar movement in Uruguay, and the situation in Buenos Ayres is regarded as critical. The example of Brazil and Chili appears to have become contagious in South American governments.

A St. Petersburg paper says it is the intention of the Russian Government to acquire possession of the entire naval shipbuilding industry of the country, and that it will establish another naval port besides Cronstadt—one not liable to be blocked by ice or blockaded by an enemy.

The number of immigrants arrived in the United States in the nine months ended September 30 was 469,276, compared with 381,379 during the corresponding period last year.

The Iron Steamboat Company report total receipts for the season $323,000; surplus, $42,000.

The labor party who are in control of the Victoria Parliament persist in obtaining foreign loans for the prosecution of public works, apparently regardless of the enormous indebtedness already incurred. Another loan of $50,000,000 is proposed.

Stewart Menzies of San Francisco will submit to the newly organized California Traffic Association a plan to establish a line of freight steamers between San Francisco and New York or Liverpool. He claims that 12 steel steamers of 4000 tons each could get enough freight to make the line profitable.

It is in contemplation to unite the four Western repair shops of the Rock Island Railroad at St. Joseph, Mo.

The Dupont powder manufacturers in Delaware have had an entire family arrested upon suspicion of having conspired to destroy their works. It is alleged that within the period of two years this gang destroyed over $250,000 worth of property, and that they are responsible for the loss of more than a dozen lives and the despoliation of 50 homes.

The Philadelphia Trade League is receiving many accessions, and now comprises the leading firms in the city. One plan is to issue a pamphlet showing the attractions of Philadelphia to be distributed among passengers by every steamer leaving Europe.

A new line from this port to Southern Italy has been started by the North German Lloyd Steamship Company.

A report comes from Philadelphia that a firm there has contracted for the manufacture of a large number of aluminum cartridges for smokeless powder, which destroys ordinary metal. A number of these cartridges have been exhibited.

The Contract Labor Law.

The United States Circuit Court of Appeals for St. Louis on Friday handed down its first decision, which is one of national interest. The case was that of the United States against S. C. Edgar, lessee of the Glendale Zinc Works of St. Louis. Edgar was charged with importing workmen from England in violation of the Contract Labor law. It was shown that one I. Boyce had written from Bristol, England, to the manager of the zinc works asking for employment for himself and a companion. Edgar replied to the letter, stating that he had arranged for their transportation and directing the men where to apply in England. The men came as far as Philadelphia, where they were intercepted by the immigrant inspector and ordered back to England. Judge Thayer of the United States District Court, before whom the case was first tried, decided that the correspondence did not constitute a contract within the meaning of the law, and that to prepay the transportation of an alien was not unlawful unless a regular contract was entered into under which the alien agreed to perform some kind of work, the terms of which both parties had agreed to. This decision was confirmed by the upper court.

The Increasing Coal Tonnage.

The approaching completion of the Port Reading extension of the Reading Railroad and of the new line which it is building to enable it to carry out its big contract with Coxe Bros. & Co., both of which will add largely to its facilities for transporting and handling coal, is likely to be followed by important changes in the anthracite coal trade. It has been known for some time that the Reading is not satisfied with the percentage of the total output allotted to it, and that in view of its great expenditures in improving and extending its properties, and of the large amount of coal territory which it owns, it is determined to demand a larger share of the trade. Under the alleged combination entered into by the large companies these are the percentages allowed to the different roads:

Railroad.	Percentage.
Reading	21.63
Lehigh Valley	18.97
Jersey Central	15.98
D., L. & W	15.54
Delaware and Hudson	10.65
Pennsylvania	10.45
Pennsylvania Company	4.84
Erie	1.94

This percentage of the Reading, the Philadelphia *Record* says, seems absurdly small when its great possessions and resources are taken into account. It has $70,000,000 invested in coal lands alone—an amount greater than the entire valuation of the Lehigh Valley Road, and more than the combined values of the coal properties of several of the companies. The following table is said to give approximately the number of acres of anthracite coal land controlled by each of the leading companies, and the tons of marketable coal remaining in the ground, with the percentages in each case:

	Acres of coal within outcrops, with percentages of total.		Tons of marketable coal remaining, with the percentages of total.	
	Tons.	Per cent.	Amount.	Per cent.
Delaware and Hudson	21,000	8.8	260,000,000	5.2
Delaware, Lackawanna and Western	15,200	6.4	400,000,000	8.0
Erie	19,800	8.3	250,000,000	5.0
New Jersey Central	29,000	12.3	850,000,000	17.1
Lehigh Valley	33,000	13.9	515,000,000	10.3
Pennsylvania	16,500	6.9	250,000,000	5.0
Total for the six companies	134,500	56.8	2,525,000,000	50.8
Reading	102,000	43.2	2,450,000,000	49.2
Total for the seven companies	236,500	100.0	4,975,000,000	100.0

This shows that the Reading owns practically half of the coal yet unmined, and 43 per cent. of the hard coal lands of the State. Yet it has had for some years to content itself with 21.63 per cent. of the total output, a much less proportion than was allotted to it ten years ago, when its facilities in the way of collieries, rolling stock and shipping arrangements were much inferior to what they are now. The Reading is now shipping more coal than ever before in its history, and in a few weeks will be in a position to do considerably more business than at present. It is reported that the other companies are unwilling to concede to the Reading any increase in its percentage.

Work has been begun on a new Brown segmental tube-wire gun at the Diamond Drill Works, at Birdsboro, Pa., under the supervision of the Government, which has made an appropriation for this purpose. The gun will be tested at Sandy Hook. The length of the core will be 18 feet inches, and the weight 4 tons.

The Iron Age

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The Chicago Bar-Iron Industry.

For the first time in many years all the bar mills in the immediate vicinity of Chicago, except the small mill at Pullman, have suspended operations. In the absence of an explanation, this state of affairs might be taken to mean that after years of trial the manufacturers of bar iron at Chicago had found that they could not compete with those of other localities. Special causes, however, have operated to bring about this peculiar circumstance. One of the Chicago mills was burned some time since and is now being rebuilt to be in readiness for resumption at any time. Another was operated by a company having insufficient capital, who were obliged to succumb because of bad debts which would have been a heavy load for a concern with a much larger bank account. Another mill is owned by wealthy men who have stood by their property very pluckily in times of severe depression without flinching, but think it advisable now to take a rest and wait until the iron trade works into better shape. The business of manufacturing bar iron at Chicago has by no means been abandoned, and manufacturers in other localities are rejoicing prematurely if they think this is really to be inferred from the present condition of the Chicago bar-iron industry.

From present indications work will be resumed at an early day by all the mills which are now standing idle. The Straight Fiber Mill has been leased by Eastern manufacturers, who certainly do not intend to permit the property to lie unproductive. The National Forge and Iron Works may be kept out of the field for a time by litigation, but it is too good a plant to be suffered to fall into decay, and must ere long be taken hold of by practical men who perceive its advantages and possibilities. The Calumet Iron and Steel Company's mill has but lately been completely overhauled and put in good condition and will certainly be started again as soon as trade prospects brighten. If it has been able to hold its own in past times of depression it will not now be abandoned by its owners. The policy of the management of the Calumet Iron and Steel Company is, however, to be commended. They found business getting lighter in volume and realized that to get their share of it they would be obliged to cut prices. With raw material at its present cost and wages schedules on their present basis they could not figure out a profit on a lower selling rate. Hence they concluded to withdraw from the market for a time rather than demoralize the trade and at the same time lose money on every ton of bar iron sold.

The stoppage of the rolling mill of the Calumet Iron and Steel Company is really a good idea at this time and should be an example to others. The lesson does not pertain solely and exclusively to the bar-iron trade, but applies as well to other branches of the iron and steel business. This is a poor time to demoralize prices. The beneficial results of the heavy crops have thus far failed to materialize, it is true, but that is no reason for becoming discouraged and believing that they will not. There must be an improvement. It is inevitable. It may be deferred until well toward spring, or it may develop sooner. In view of this it seems to be the hight of folly to force the market now and to bring about a demoralization of prices, and a congestion of products such as should only be expected in times of severe depression with not a ray of light ahead. If those concerns that have been unable to supply themselves with orders to tide over this dull period will but follow the example of the Calumet Works and shut down, the time of general activity will be drawn closer and the tide of prosperity to come next year will be made stronger.

The Critical Temperature of Steel.

At the June convention of the American Railway Master Mechanics' Association, an official report of the proceedings of which is before us, the question, can steel be flanged safely at other than a red heat? was discussed. It is the rule in boiler shops to work steel at a red heat, but it is more than probable that all do not realize the danger incurred when this rule is not closely followed. This danger was illustrated by two samples of open-hearth steel shown by Charles Blackwell of Shoenberger & Co. of Pittsburgh. One end of each piece had been doubled over cold. The closest inspection failed to discover any signs of distress. The central portion of each piece had been twisted when red hot so as to resemble a corkscrew, and, as might be expected, there were no indications of failure. The other end of each piece had been bent at a temperature of about 600°, or that corresponding to a blue color on the surface from which the scale had been removed. Each piece was badly fractured at the center of the bend. Cherry red is the last visibly recognizable degree of heat before the metal becomes black, and has been recommended by the American Boiler Makers' Association as the limit at which all work should stop. Iron as well as steel is subject to this dangerous condition at about 600°. J. N. Lauder of the Old Colony Railroad said: "All steels that I have ever made any experiments with are brittle at a temperature that will produce a blue color when brightened. I have tried many experiments with the best Otis fire-box plate and found in every case that although while cold it would double down and hammer down under a trip hammer without a sign even of distress, at the blue temperature it would break invariably." Pulaski Leeds of the Louisville and Nashville road said he believed there was a danger point in heated steel and he did not advocate the use of steel axles for the reason that they quite often get to this temperature. When heated to this degree the least vibration will produce a flaw. He stated that an examination of broken crank pins and steel axles would almost invariably show a fine flaw, perhaps the size of a half section of a silver half dollar, that is apparently old, the rest of the entire axle being bright, clear and fine-grained steel. It had always been his opinion that those flaws had been produced at the time when the metal had reached the dangerous temperature, caused by a hot journal or something of that kind. He thought vibration was necessary in order to produce hurtful effects.

James Meehan of the Cincinnati, New Orleans and Texas Pacific road stated that he had seen some specimens of basic steel tried under all circumstances and all temperatures without developing any fracture. This, he was inclined to think, was due to the fact that phosphorus is so thoroughly eliminated in basic steel that it will not be subject to the defects under different conditions that carbon steel is.

It is difficult to overestimate the importance of this subject. Although it was brought before the American Society of Mchanical Engineers some years ago, the fact that steel is brittle at a certain temperature was not forcibly impressed upon those working steel. The matter has been investigated by experienced men, who agree in warning against any working during the blue heat.

Foreign Beams.

Quite a number of importers and merchants in Eastern ports are looking up the question of securing a foothold in the beam market. We know of three concerns who are studying the situation and are completing their arrangements for placing the foreign product in the hands of consumers. At first sight the temptation to enter the business seems great. The American Beam Association has for a long time maintained the price of 3.1 cents per pound, delivered, in the East, and shows no disposition to lower it. Foreign beams can be sold in this city at 2.35 cents, so that there is an apparent margin to work on of $15 per ton of 2000 pounds. So far as we can learn, however, the beams thus offered are foreign sections, of which very few indeed can be taken by architects and builders without seriously modifying their plans. The difficulties are such that only very few can avail themselves of the offers made. It is a very different matter, however, with those foreign beams which are rolled in exact duplication of American sections. We understand that such beams of good quality are offered at 2.60 cents, which would represent a cut of ½ cent a pound under the American standard of price.

Their use would not involve any inconvenience, so far as their dimensions are concerned. But imports are hampered by other considerations. Architects have been getting into the habit more and more of specifying at the latest moment, depending upon quick delivery by the mills. That, of course, they cannot do when they place orders for foreign beams. The future of the business is too uncertain to allow importers to go to the heavy outlay and run the risks of carrying a large stock of beams. They must therefore confine themselves to efforts to secure the large contracts for buildings, which involves their entering into a business new to them, or they must sell to the large architectural works who handle important quantities of beams. As a matter of fact, the greater part of the business has been done in this way, giving the large architectural works decided advantages. The American mills which have been urged to forestall the importation of foreign beams of American sections have thus far shown no disposition to reduce their price. They do not look upon the situation as serious, and are probably right in that view. But the fact remains that the longer the great difference in price exists the greater will be the temptation to European works to arrange for an equipment of rolls for American sections, and the sooner will the foreign price of them approach the figures for standard European sections abroad.

There is a great deal of grumbling and complaining among iron manufacturers over the unsatisfactory condition of trade. But we question whether many of them realize what a narrow escape they have had from something far worse. Let them think what would have been the consequence if crops in this country had been short and crops abroad had been large, or if crops here and abroad had been equally heavy; or if crops abroad had been even up to the usual average and crops here had been very heavy. The conjunction of heavy crops here and scanty crops abroad is the event of a generation. If now the iron trade languishes under such favorable auspices for this country as a whole, what would have been the situation by this time under any other contingency than that which happened? Evidently failures would have been very numerous and 1891 would have been a year long to be remembered as a veritable panic year. Here is something to be thankful for, and very thankful, too, if it is merely of a negative character, that affairs are no worse than they are.

Usually the starting of new manufacturing plants attracts more attention and is accorded greater significance than the facts warrant, so far as the supply of product is concerned. Newcomers generally have a strong interest in making their appearance widely known. They rarely understate their capacity, and make themselves felt, too, as eager sellers who cut the market to gain a foothold. It is no wonder that they make an impression. On the contrary, the diminution of the supply by the stoppage of old concerns only comes before the public prominently when commercial disaster has overtaken them. The dryin up of old concerns is so slow a process that their final stoppage is preceded by a long period during which they occupy the attention of competitors and consumers but little. It must not be forgotten that new capacity does not necessarily imply full addition to the supply, but that often a modern plant practically takes the place of antiquated establishments left stranded in the current of progress.

Close Measurements in Shop Practice.

It is interesting to study the extent to which close measurements in what we may term ordinary machine shop practice are now carried. A somewhat extended inquiry embracing large and small establishments, those turning out standard machines and those engaged in the production of special work, has demonstrated conclusively that closer measurements are now the rule and are much more common than a few years since. Inquiry as to what caused this change, what made it possible, practicable and economical, is a question demanding close attention and intimate acquaintance with the recent past and the present. The growth of the interchangeability of parts idea had much to do with the development of close measurements. This idea took deep and permanent root for the simple reason that the manufacturer who could supply on demand any part of his machine had a strong hold on the market. The idea was a good one, since it permitted the replacing of the weakest link without undue trouble. Evidently it became desirable and in fact absolutely necessary to so make the several parts of several machines that they could be interchanged, and, when required, replaced. At that time this applied to only single isolated establishments.

The custom has been carried further than this, and it is now possible to order work from widely separated shops with the conviction that the parts when put together will fit. To express this in a rather rough way, it may be said that a few years ago ten men measuring the same distance would produce ten varying results, and therefore ten shops engaged in the production of work calling for the same dimensions would yield ten specimens of different sizes. The grinding machine was then well-known and appreciated, and the reason that accurate measurements were not more widely adopted did not, we think, lie in any fault in its construction or in any lack of appreciation. We think the whole secret of this advance lies in the fact that the mechanic now is provided with implements by means of which he can make accurate measurements. While the standard of length of the 2-foot rule has not changed during the past years, there are now more men who are agreed as to what that exact length is and are capable of measuring it and its subdivided parts. This is due to the introduction and perfection in the design and construction of gauges and in the use of standard specimens such as plugs and rings from which as a foundation the measurements for all work in the shop are derived. These are now placed on the market by several manufacturers, and it may be safely asserted that those made by different concerns when compared with one another will not vary appreciably. This has resulted in placing in the hands of the mechanic a standard easily handled and accurate, from which he derives all his finer measurements.

How far or to what degree of accuracy the idea may be carried depends largely upon the design of the particular machine and the work it is expected to perform. We find that variations of one one-thousandth of an inch are considered in the majority of shops as approaching coarse work. Allowable variations of one-half of a thousandth of an inch are very common, and in some cases we find the limit fixed at one-quarter of a thousandth. This applies to what we may term ordinary work, and is in many shops every-day practice. How much further the refinement may be carried to advantage is an open question. There is a limit beyond which, while it is possible, it is neither practicable nor economical to go, and exactly what this limit is, depends directly upon the machine itself. When talking upon this subject recently with one of the leading manufacturers of gauges in the East, the question was asked as to how close to a desired dimension he could work. The reply was that he would make an inch plug and warrant it not to vary from that dimension even the one-millionth part of an inch. In explanation the remark was made, "If any fool wants a plug of that description I will make it and guarantee it not to vary more than the specified amount, and it remains with him to prove that it does." The result of the accurate working to dimensions now so general has been an advance directly in machine shop practice and we think a tendency to a higher grade of mechanics. A man accustomed to drawing a line, and cutting to it and not near it, as was usual only a short time ago, is under an influence tending to elevate him.

Governor George W. Steele of Oklahoma, who is deeply interested in the new gun factory to be established at Marion, Ind., describes Dr. Gatling's method as follows: A core or center piece is set in the middle of the mold, which is in turn built in a pit in the foundry floor. The pot or kettle containing the steel is carried on a crane above this mold, which is open on top. The steel is poured into the space around the core, the vessel containing it being moved constantly around the circle of the opening of the mold so that the steel falls into place in the shape of an ascending spiral spring. When the mold has been filled with the steel, the core is quickly removed and a strong current of artificially cooled air is forced through the bore of the new made gun. This has the effect of cooling the inside of the gun before the outside, and produces the hardest metal and highest temper just where it is most needed, on the surface of the bore of the cannon.

CORRESPONDENCE.

The Nail Question.

To the Editor: Would your subscribers be interested in reading the views of one long familiar with nail making who has been watching with curious interest, not unmixed with sympathy for his old associates, the death grapple between the cut nail and wire nail manufacturers?

The history of the contest may be briefly summarized: The wire nail, handsome, strong, novel, advertised with large claims, and paying, at first, an enticing profit to the middleman, came at once into prominence, has found a widening market, and was sold last year to the extent of 3,000,000 kegs, a quantity representing one-third part of the nails used in the United States. Are the wire nails, then, an assured success, and will they displace cut nails?

Let us first consider the conditions of cost and price of the two nails. With Bessemer iron at $15.75 per ton, steel nail slabs at $25 per ton and steel plate at an average cost of 1¼ cents per pound of nails (all prices representing cost, without profit, in the most favored districts), a steel cut nail factory must add to the cost of the steel in a keg of 60d. nails ($1.50) the following items, viz.: For chopping, heating, carrying, packing, branding, storing, shipping and miscellaneous labor in factory and storehouse, say 10 cents per keg; for cutting, 10 cents; for keg, 12 cents; for steel, grindstones, machinists and repairs, 3 cents; for selling expenses, commissions, guarantee or risk and the factory's share of salaries and standing expenses, 12 cents; for freight to market, say 12 cents. This sums up 59 cents per keg and makes the cost of a keg of 60d. nails, made under the most favorable circumstances, $2.09, delivered, without allowance for profit or interest on capital. A wire nail manufacturer so favorably situated as to have his wire cost him $1.90 per keg of 60d. nails, must add nearly the same items to the cost of his wire that the cut nail manufacturer adds to that of his plate, but perhaps a trifle less. He adds, say, 50 cents, and the cost of his 60d. nails is $2.40 per keg.

Those who are familiar with the selling price of nails will see that there is little choice between the loss on a keg of cut nails and on a keg of wire nails. The day when the wire nail could be sold at a fancy price has gone by. In taking a third of the market, and compelling the manufacturer of cut nails to sell at a heavy loss, the manufacturer of the wire nail has been forced to make the same heavy loss himself.

If the wire nail were a successful invention this would not be its record. Such an invention makes money, not loses it, while taking a market. Not being a success, the wire nail will not drive out the cut nail; and the question next presents itself, can it even retain its present position in the market? Evidently its merit is not sufficient to free it from the necessity of competing in price with the cut nail; but in this competition it has no chance. Nail for nail, of given weight, the cut nail can be made far cheaper than the wire nail; and the public are slowly but surely learning by experience what science, unheeded, told them at the beginning—namely, that the tapered cut nail has nearly double the holding power in ordinary building woods that the wire nail of the same weight has; and that the lighter the nail is (either cut or wire), the less is its holding power. The claim of "a good many to the pound" has lost its charm, and time is vindicating the wisdom of the cut nail manufacturers, who obstinately refused to diminish the holding power of their nails by unduly lightening them.

How are these basic facts to be reconciled with the other fact that the sale of the wire nail has steadily increased?

The sale has increased in consequence of a constantly decreasing price, of desperate effort to sell, and of the opening of new markets as old ones closed.

The course of the wire nail market has been like that of a ship at sea, constantly pushing into new latitudes, throwing foam and spray from its bows, but leaving behind it no mark of its progress excepting its evanescent wake.

The wire nail has now exhausted all the markets of the country. No hidden corner or remote town or smallest customer has been left unexplored by the ubiquitous wire nail drummer. If the wire nail is to live it must hold its old markets; there are no new ones for it.

The middleman is no longer zealous in the introduction of the wire nail. There is now no fancy profit in its sale. Many of his customers insist upon having the cut nail; and in selling wire nails, also, to meet the wants of any who may inquire for them, he finds himself obliged to carry a double stock of nails for a single profit, and a small one at that.

Since the course of the market shows that the wire nail cannot be sold through any intrinsic merit, but must find a market by selling at a low price, and since it cannot be cheaply made, and since it is laying a burden, rather than bestowing a profit, upon the middleman, I see no future for it.

The public throughout the country are testing the wire nail. The verdict will come in from all sections nearly simultaneously. I do not think it will be a favorable one.

I foresee for the wire nail manufacturers a rapidly fading demand and falling prices met with desperate efforts, already commenced, to control a declining market by combinations which will be as fruitless as were those of the cut nail manufacturers to maintain the price of their goods when the wire nail manufacturers were taking the market from them. The tide has already turned, and the ebb of the demand for wire nails will be as rapid as its flow was surprising. Excepting for use in a few special cases the wire nail will, I think, soon cease to be made.

I foresee for the steel cut nail manufacturers increased markets, already foreshadowed by the larger demand and more hopeful feeling prevailing in Wheeling and at other centers of steel nail manufacturing. I foresee for them better prices as soon as they recover their senses and realize that the tornado has exhausted its strength, and that it is time for them to set their sails to catch the favoring breeze. The first thing for them to take in is, that it will henceforward be choice, and not price, that will decide the purchase of nails. Those who want cut nails will not have wire nails at any price. Those later purchasers who, in the ardor of first love, are now using the wire nails, will use them regardless of cost—until they become better informed, and then their practice will be reversed.

The cut nail manufacturers will soon be in possession of their old markets, increased by the growth of half a decade. They should not lie with closed eyes, thinking that the long night will have no end, when the sky is already brightening with the light of the coming dawn, invisible only to those who, having eyes, will not see. UMPIRE.

Texas Iron Ores.

To the Editor: Permit me, as superintendent of furnace and mines of the New Birmingham Iron and Improvement Company, to correct the impression likely to be made respecting the Texan ores generally by the article in your issue of October 15, containing the gist of census report on iron ores of the United States. It contains the following statement, taken, of course, from the census tables: "In the total cost of producing iron ore, Alabama is the only State which averages less than $1 per ton—viz., 82 cents per ton. Next in order of cost comes Texas at $1.05," &c.

Now, the total cost of mining here is under 50 cents per long ton, and a very large area of this portion of the State is covered with ore that can be mined at as low or lower rates than this. I use the term "covered," as it pretty nearly expresses the actual position of the blanket deposit of ore, which forms a horizontal stratum of from 24 to 42 inches in thickness on the tops of the surrounding hills and table lands, at a regular hight of about 150 feet above the furnace yard, or about 650 feet above sea level, the brows of the ranges of hills being in every case marked by the outcrop of the ore, which is only covered by a layer of surface soil ranging in depth from nothing at the outcrop to 6 feet in deepest stripping worked so far. Much of our outcrop ore has been mined and delivered in the stock house by contractors for 35 cents per long ton, and some of it for as low as 45 cents per ton, the actual cost of mining in these cases being about 28 cents per ton (the balance being the cost of hauling by wagon). The very irregular contour of the country affords a great stretch of this outcrop ore, so that on the property of this company I estimate that there are over 25 miles in length of ore that can be mined at the above rate, and there is, of course, the same development throughout the rest of the counties of Cherokee, Rusk and adjoining territory; in fact, its actual extent is, I might say, unknown. The ore yields about 45 per cent. in the furnace, and by roasting can be made to run somewhat higher. It is a brown hematite, differing from the ordinary bog ore in its comparative freedom from phosphorus, and in many places it is almost as solid and heavy as a Lake Superior specular, and breaks with a sharp, conchoidal fracture. The ore itself and the soil in contact with it are remarkably free from organic remains, to which fact may be attributed its comparative freedom from phosphorus; we hope shortly to demonstrate that we can from this ore alone produce a superior quality of iron for Bessemer purposes; its value as a car-wheel iron being already fully proved. As it is a matter of importance to those who have the interests of the State at heart and who are engaged in developing her resources that such facts as these should be brought distinctly before the public, I trust you will, with your accustomed courtesy, permit me, through the medium of your valued paper, to correct a statement which recent developments are proving to be erroneous, though in the past it was doubtless correct.

Yours obediently,

SAML. D. MILLS,
Superintendent.

NEW BIRMINGHAM, Texas, October 21.

The Westinghouse Electric and Mfg. Company of Pittsburgh have entered suit in the United State Courts of that city against the Pittsburgh and Birmingham Traction Company for the infringement on their patents, covering a new device on an electric motor, rendering them both noiseless and durable. The invention was made and patented on December 9, 1890, by Albert Smith, and was assigned by him to the Westinghouse Electric and Mfg. Company. It is stated that the Westinghouse firm have put several hundred of these motors in use, and with what is claimed to be very satisfactory results. The success of the motor made them so desirable that nearly all of the other companies engaged in the same business have,

it is alleged, taken the risk of infringing on the patent. The present suit is, therefore, an important one, and is brought with the view of making it a test case.

The American Street Railway Association.

The tenth annual convention of the American Street Railway Association was called to order in the parlors of the Monongahela House, Pittsburgh, on Wednesday morning, the 21st inst., by President Henry N. Watson. Secretary Wm. J. Richardson called the roll and also read a number of letters and telegrams from members who were unable to be present. The first session was taken up in reading the annual address of the president, the report of the Executive Committee and the treasurer's report. The latter showed that the receipts were $7122.70 and the expenses $5380.64, leaving a balance of $1742.06. The address of the president was quite lengthy but interesting, and was listened to attentively by every one present. After paying a high compliment to Pittsburgh on the hospitality of its citizens and also on the enterprise displayed, President Watson said in substance:

The most important matters to be discussed in convention will be the problem which arises in the application of electricity to street railway traffic. It is a source of no little satisfaction to us to know that in the development of the electric railway America leads the world. Three years ago there were only 13 electric roads in the United States; now there are over 400, and the advices from every part of the country indicate that before the close of the present year the number will be increased to 500. The capital now invested in American electric railways exceeds $75,000,000.

The following statistics have been compiled from the returns made by street railway companies in the United States and Canada to the middle of September, and are believed to be as reliable as it is possible to make them: Total number of miles, 11,030; number of miles operated by animal power, 5443; number of miles operated by electricity, 3009; number of miles operated by steam motors, 1018; number of miles operated by cable, 660. Total number of cars employed in street railway traffic, 36,517; number of cars operated by animal power, 25,424; number of cars operated by electricity, 6732; number of cars operated by cable, 3317; number of cars operated by steam motors, 1044; number of horses employed, 88,114; number of mules employed, 22,002; number of steam motors, 200. Number of companies operating street railway lines, 1003; number of companies operated by animal power, 537; number of companies operated by cable, 54; number of companies engaged in building new lines, about 75.

It is interesting to note that since November, 1890, the number of horses employed on street railway lines has fallen from 116,795 to 88,114; that is, 28,681 in one year. At this rate it will not take long to emancipate the horse from the street railway business.

According to the official figures taken from one of the street railway journals for the month of October, 1891, Philadelphia leads with 510 miles of single track. And after the Quaker City comes Chicago with 452 miles, New York with 289 miles, Brooklyn 285, Boston with 283, St. Louis 275, Baltimore 207, San Francisco 205, Cleveland 192, Cincinnati 180, Pittsburgh 168, Kansas City 141, New Orleans 139, Louisville 132, Buffalo 110, Minneapolis 101, Los Angeles 90, Detroit 94, Birmingham, Ala., 92, St. Paul 90, Washington 85.

The official figures of the census just completed show that in December, 1889, 476 cities and towns possessed rapid transit facilities. And it is now difficult to find any town of 5000 inhabitants without one or more street railways.

While a large majority of us are interested in electric street railways, electricity will not be permitted to monopolize this convention. One of the features prepared for us will be the report of a special committee on "A Year's Progress in Cable Motive Power." Where streets are straight, and grades are steep, and the traffic is limited only by the number of cars that can be operated, a well-constructed cable system may have economic advantages that would be better understood.

After the president had concluded his address and some preliminary business had been finished, the first paper of the convention, entitled "A Perfect Electric Motor," was called. The author of this paper was H. A. Ebbert of Cleveland, but in his absence it was read by Secretary Richardson. The afternoon of the first day was given up to sightseeing. A number of the delegates visited the various power houses in Pittsburgh and Allegheny, while quite a number availed themselves of the opportunity to visit the large works of the Westinghouse Electric and Mfg. Company, located on Garrison street in Pittsburgh. The association convened in the evening, and after being called to order, Chas. Clemins Hard moved that a committee of seven be appointed by the chair to recommend officers for the coming year and to name the next place of meeting. This motion was carried and the committees were named on the following day.

Two papers were then read, one entitled "Cable Motive Power," prepared by Jas. Clifton Robinson, and the other on "The Dependant Overhead or Underground System of Electric Motive Power," by Geo. W. Mansfield. Mr. Richardson stated that Mr. Mansfield had prepared an abridged paper, and it was decided to read this paper to the convention. The abridged report was read, the most important points brought out being given below:

The earliest suggestion for the use of moving cable within a conduit was by W. Brandlingin in 1845. Thirteen years later an invention was put forward by E. S. Gardiner of Philadelphia. Subsequently numerous devices for overhead and underground cables were made, but no solid progress obtained until 1869, when General Beauregard first introduced a system in New Orleans. In San Francisco credit is due for the first great practical development of cable traction, which was put in operation in 1873. New York followed by building a road when the Brooklyn Bridge was erected, in 1883, and the Tenth avenue line was completed in 1886.

A TABLE OF EXPENSE AND PROFIT.

The first appearance of cable tramways outside of the United States was in New Zealand, where a line was built connecting Roslyn with Dunedin, which was opened in 1882. Cables were introduced in Europe by the Highgate Hill tramway in London. Roads were then built in Edinburgh and Birmingham, where 6 miles were completed a year ago.

The cost and profit of operating railways the writer gives as follows:

	Average cost per mile.	Net profit.
Steam	$0.22½	$0.09¼
Electric (storage)	.19¼	.10¼
Horse	.19¼	.01¼
Caebl	.12¼	.12⅞

Melbourne, Australia, has just completed a splendid system of cable roads of about 85 miles length. The Los Angelos road is troubled by sharp curves, which are severe on the life of cables, and they only average ten months. Speed of cables averages eight miles an hour.

In the United States, Europe and British colonies there are 75 cable roads in operation, representing a capital of $100,000,000 and embracing 700 miles of track and 3500 trains of cars, the speed attained being from 6 to 14 miles an hour, about 50,000 horse-power being used to propel them.

The advantages of cable roads are summed up as follows:

1. Financially, the cable road shows a low operating cost and a high earning capacity.

2. Practically, it ranks foremost in trustworthiness and complete independence of climatic conditions.

3. Socially, it can claim that through its agency no district is cut off from sharing in rapid transit or intercommunication with other systems.

4. Personally, the cable road appeals to public patronage, as it presents nothing offensive, actual or resultant, and is most comfortable.

5. Sanitarily, the system confers the negative gain of contributing no nuisance.

6. Generally, it can be alleged of cable traction that no condition, demand or requirement in city traffic can be made that it cannot fulfill, demonstrating it to be well in the lead of all modes of affording internal transit to cities.

A paper prepared by Mr. Mansfield was then read and was received with considerable interest. He said in substance:

I have arranged various applications under four headings. 1. Underground. 2. Surface. 3. Overhead. 4. Storage. Under the heading of underground I have classified all methods. I might possibly divide this into two classes, continuous bare conductors placed in an open slatted conduit, and also all other devices of automatic character which enable the contact piece or device on the car to take its electric current from sectional bare conductors. Four practical experiments have been made with the first class, but I have no hesitation in saying it is a failure. No practical experiments have been made with the second class.

The surface method is similar to those employed in the conduit system, only in place of being in a conduit, they are placed upon the surface of the street.

There are two general methods of operating the overhead system. One is by having a continuous trolley wire wherever the track runs and the second is to have this trolley wire divided into sections. I firmly believe that the trolley wire system is here to stay for many decades. Although I hope for a successful underground system, it may never come.

The speaker also stated that the breaking of trolley wires is rare, and in no instance has a casualty occurred, except when a mule was killed. Forty-one roads have trolley wires divided into sections. Several accidents have been reported by collisions and running over, but these cannot be avoided.

As to the cost of operation, Mr. Mansfield said it was a difficult matter to handle, and a delicate one to discuss, as there is to day no generally accepted uniform system of accounting. It simply adds to the confusion to publish additional figures unless the most thorough detail is entered into. He urged the adoption of some standard system.

This paper was received with enthusiasm, and the veteran street railway man, Wm. Richardson, moved that it be put on the minutes in full and a vote of thanks be tendered Mr. Mansfield for the full and explicit and exhaustive report on the subject. The motion was adopted unanimously.

There was a discussion on the subject, which was participated in by men from all over the country.

The association reconvened on Thursday morning about 11 o'clock, the first business transacted being the appointment of the committee to nominate officers and recommend the next place of meeting, after which the report of G. H. Scribner on "Public and State Treatment of Corporate Property" was read by C. W. Wyman of New York in Mr. Scribners' absence. In the report Mr. Scribner declared that the system of taxation in New York and other States is enormous; that within the past few years the rate of taxation on one New York line has increased until this year one line has paid an advance of 50 per cent. The independent storage or primary battery system of electric motive power was discussed by Knight Neftel of Lancaster. The paper dealt principally with batteries and the progress made in the use of this kind of motive power. It was almost 3.30 o'clock in the afternoon

before the convention got down to business for the final session. Secretary Richardson read a lengthy communication from Willard A. Smith, chief of exhibits for the World's Fair at Chicago, which set forth that it was the purpose to erect a building at a cost of $350,000 in which to make a complete display of street railway appliances of every kind. Tracks will be laid in the building, Mr. Willard stated, and everything done to make the display a thoroughly practical one. He concluded by requesting that applications for space be sent in as early as possible. The matter was referred to the Executive Committee, with power to complete all arrangements. Acting on a proposition from J. H. Bickford, chief engineer of the Naumkeag Street Railway Company of Salem, Mass., it was decided to form a street railway engineers' organization from among the members of the association.

A very interesting paper was next read by O. T. Crosby, president of the Utica Belt Line Railway Company, on the subject of "Standards on Street Railway Practice." The paper excited considerable interest, and quite a discussion took place. The next business taken up was the question of the next meeting place of the association. The cities of Boston and Cleveland were the only ones mentioned, and after some good-natured rivalry had been indulged in it was finally decided to hold the next meeting of the association in Cleveland. The following officers were then elected:

President, John G. Holmes, president of the Citizens' Traction Company of Pittsburgh; first vice-president, Thomas K. McLean, New York; second vice-president, J. B. Speed, Louisville; third vice-president, A. E. Lang, Toledo; secretary-treasurer, W. J. Richardson, Brooklyn; executive committee, Henry W. Watson, retiring president, ex-officio chairman; L. Perrine, Jr., Trenton, N. J.; W. B. Dean, St. Joseph, Mich.; Murray A. Verner, Pittsburgh; T. F. Remington, Chicago.

In the evening a banquet was held at the Monongahela House, at which Major Gourley and other public officers of Pittsburgh were present. The next day, Friday, was devoted altogether to sightseeing, many of the important industrial establishments of Pittsburgh being visited by the delegates. A large number of visiting members went to Braddock and inspected the Edgar Thomson Steel Works at that place; others to the Mayflower excursion boat, and proceeded down the Ohio River to Davis Island Dam and thoroughly inspected that structure Many of the delegates left for their home on Friday, while a few remained over until Saturday. The meeting was said to be one of the most successful that the association has ever held, and the Pittsburgh Committee was warmly congratulated on the excellent arrangements it had made to entertain the delegates. The only fault to be found with Pittsburgh, as many delegates stated, was insufficient hotel accommodations. Many of the visiting members were compelled to stop with friends, and others had to go to private houses in order to secure lodging. There was plenty to eat for everybody, but sleeping accommodations were at a premium. One of the prominent features of the meeting was the excellent display of electrical appliances, which was placed in the corridors of the Monongahela House, and also on the steamboat J. M. Gusky, which was anchored in the Monongahela River just below the hotel, Every prominent electrical concern in the country had an exhibit of some kind, and they all attracted a great deal of attention.

Four steel gunboats for the Amazon River have been built in England for the Brazilian Government. They are 90 feet long, galvanized throughout and draw less than 5 feet. The engines are compound surface condensing, the air and bilge pumps being driven off the main engines in the usual way. The water is circulated through the condenser by an independent pumping engine of the duplex type. The cylinders are 12 inches and 24 inches in diameter by 12 inch stroke. The boiler is of the ordinary return-tube type, and is of steel with metal tubes. It is 8 feet in diameter by 9 feet 3 inches long, and has 655 square feet of heating surface and 27 square feet of grate area.

Eight Months' Foreign Trade.

We print below the details of the imports and exports of iron, steel, metals and their manufactures for the first six months of the current year compared to the same period in 1890. The falling off in the imports of cotton ties and hoops, in cutlery and in fire arms is particularly noticeable.

Imports.

Articles.	Eight months ending August 31. 1891.	1890.
	Gross tons.	Gross tons.
Tin in bars, blocks, pigs, or grain or granulated	12,314	9,574
COPPER, and manufactures of:		
Ore (fine copper contained therein)	3,569	1,615
Pigs, bars, ingots, old and other unmanufactured	1,113	92
IRON AND STEEL, and manufactures of:		
Iron ore	655,197	924,018
Pig iron	87,805	101,226
Scrap iron and steel, fit only to be manufactured	26,888	26,958
Bar iron, rolled or hammered	10,398	17,416
Bars, railway, of iron or steel, or in part of steel	157	151
Hoops or ties for baling purposes, barrel hoops and hoop or band iron or steel, flared, splayed or punched	.....	10,953
Hoop, band or scroll iron or steel	319	4,359
Ingots, blooms, slabs, billets and bars of steel and steel in forms n.e.s.	22,169	16,842
Sheet, plate and taggers iron or steel	7,794	5,486
Tin plates, terne plates and taggers tin	293,230	209,773
Wire rods, of iron or steel	32,247	37,991
Wire and wire rope and strand iron or steel	3,243	2,858
Manufactures of, n.e.s.:		
Anvils	546	1,011
Chains	349	439
	Dollars	Dollars.
Cutlery	638,518	1,892,544
Files, file blanks, rasps and floats	54,313	47,433
Fire arms	398,437	1,013,318
Nachinery	2,175,342	1,853,368
Needles	.... *	184,110
All other	1,765,130	1,197,319
	Gross tons.	Gross tons.
ZINC OR SPELTER, and manufactures of:		
In blocks or pigs, and old	244	719
	Dollars.	Dollars.
Manufactures of	15,718	25,743

In the exports the heavy increase in the export of copper is worthy of note.

Exports.

Articles.	Eight months ending August 31. 1891.	1890.
AGRICULTURAL IMPLEMENTS:	Dollars.	Dollars.
Mowers and reapers, and parts of	1,539,969	1,487,985
Plows and cultivators, and parts of	347.788	582,379
All other, and parts of	730,699	666,427
Total	2,618,456	2,736,791
	Gross tons.	Gross tons.
COPPER, and manufactures of:		
Ore	29,953	15,287
Ingots, bars and old	22,409	3,353
	Dollars.	Dollars.
All other manufactures of	156,527	97,888
	Gross tons.	Gross tons.
IRON AND STEEL, and manufactures of:		
Pig iron	8,813	10,850
Band, hoop and scroll iron	145	4
Bar iron	956	737
	No.	No.
Car wheels	10,050	7,646
	Dollars.	Dollars.
Castings, n e.s.	454,634	617,407
Cutlery	97,672	72,685
Fire arms	550,149	477,533
Locks, hinges and builders' hardware	1,363,509	1,395,240
Machinery, n.e.s	6,198,698	5,537,828
	Gross tons.	Gross tons.
Ingots, bars and rods of steel	492	117
Nails and spikes:		
Cut	2,929	3,917
Wire, wrought, horseshoe and all other, including tacks	553	573
Plates and sheets:		
Of iron	298	868
Of steel	83	183
	Dollars.	Dollars.
Printing presses, and parts of	257,812	218,447
	Gross tons.	Gross tons.
Railroad bars or rails:		
Of iron	160	36
Of steel	6,788	9,984
Wire	8,216	6,682
	Dollars.	Dollars.
Saws and tools	1,218,403	1,187,030
Scales and balances	213,528	183,145
Sewing machines, and parts of	1,881,477	1,854,113
Steam engines, and parts of:		
Fire engines	5,630	2,362
Locomotive engines	2,410,965	707,225
Stationary engines	147,969	194,662
Boilers and parts of engines	430,745	383,597
Stoves and ranges, and parts of	161,841	142,633
All other manufactures of iron and steel	2,756,349	2,230,006
Total value	19,578,846	16,785,045
	Gross tons.	Gross tons.
ZINC, and manufactures of:		
Ore or oxide	4,823	2,077
Pigs, bars, plates and sheets	967	1,266
	Dollars.	Dollars.
All other manufactures of	20,055	13,055

* Free of duty.

It will be noted that the exports of locomotives have risen to very large figures.

Pennsylvania Machinery for the World's Fair.

Dr. Edward H. Williams of the Baldwin Locomotive Works, Philadelphia, who is chairman of the Committee on Exhibits of Machinery from Pennsylvania for the World's Fair, desires to obtain the address of all manufacturers of standing throughout the State of the types of machinery indicated below: Apparatus for the generation and transmission of power, steam, electric, hydraulic and pneumatic, and all fittings and accessories needed by these; fire engines and fire apparatus of all kinds; machine tools and machines for working metals; machinery for the manufacture of textile fabrics and clothing; machines for working wood; machines for typesetting, printing, stamping, embossing and for making books and paper working; lithograph, zincograph and color printing; photo-mechanical and other mechanical processes for illustrating, &c.; miscellaneous hand tools; machines and apparatus used in various arts; machines for working stone, clay and other minerals; testing machines and all apparatus pertaining to the making of iron and steel. This may be said to embrace all branches of engineering. All communications should be addressed to Dr. Williams.

Sir Henry Bessemer, the great inventor and metallurgist, read a paper at the last meeting of the Iron and Steel Institute, in which he described his invention of fluid rolling of steel for sheets. made 30 years since, and suggested some improvements.

The most thorough, practical work thus far done in this direction has been accomplished by Edwin Norton and his associates in Chicago.

Bids for Ocean Mail Service.

The bids for ocean mail service under the new law were opened on Monday by the Postmaster-General. There were 12 bids for 11 different routes, on four of which service will be established if the bids are accepted and contracts executed. These are: Boston to Liverpool, by Queenstown; New York to Argentine Republic; New Orleans to Colon, and Galveston to Laguayra, Venezeula. After all the bids had been opened and examined the Postmaster-General made an estimate of the cost of the service, provided all of them are accepted and contracts executed, as follows: First year, $660,000; 1893, $893,000; 1894, $1,516,000. The bids require that the period of voyages on lines now performing the service shall be shortened 10 to 30 per cent., as compared with the present duration of voyages. To do this new and additional ships will be needed, and it is estimated that at least 17 will be required in all, the aggregate cost of which will be not less than $14,000,000. Full service on all the routes advertised under the law would require nearly 60 ships, all told, of American build, and carrying the American flag.

The Postmaster General has information respecting negotiations in progress for other routes for which no bids were received, on which bids have been deferred for various reasons. This is the case of the New Zealand service, where the difficulty seems to be that the New Zealand authorities have had under favorable consideration a proposition to grant a subsidy to the Spreckels Company in order to improve the mail facilities between that colony and the United States, but as they insist that some of the vessels shall sail under their flag, this, of course, would exclude such vessels from the benefits of the act. Another case is that of the United States and Brazil Steamship Company of New York, who, after a more careful study of the requirements of the schedule, have found that it will not be practicable to comply with all of them. Their bid to-day was found to vary from the advertised schedule.

It is altogether probable that a new advertisement for proposals will be issued and that the result will be the offering of bids which may be accepted for service on several of the routes not covered by Monday's bids. The result of the first advertisement is more encouraging, on the whole, than many expected, and if pending negotiations for reciprocity agreements with the Central and South American republics and the British West Indies shall be successful there will be sufficient reason to believe that the results of a second advertisement will also be encouraging.

The new line to the Argentine Republic will require three new iron or steel ships, each of a gross registered tonnage of at least 5000 tons, so built that they can be used as armed cruisers if necessary in case of war. These vessels are to be capable of maintaining a speed of 16 knots an hour at sea in ordinary weather, and are to make the outward voyage from New York to Buenos Ayres, touching at Monteveido, Uruguay, in 18 days.

It is understood that the Pacific Mail Steamship Company have already built new vessels for the New Orleans and Colon route, and will be ready to establish the service on November 1, or as soon as their bid is accepted and a contract executed. The service is to be fornightly, and the time each way six days. Vessels are to touch both coming and returning at Greytown and Bluefields, Nicaragua, Port Limon, Costa Rica and Carthagena, Savanilla and St. Martha, Colombia.

The proposed new line from Galveston to Laguayra is to be composed of fourth-class vessels, and the service is to be three times a month, and to begin April 1, 1893. It is proposed that the vessels shall return by Curacoa, Savanilla, Carthagena and Colon.

The other new line for which a bid was submitted is from Boston to Liverpool, by Queenstown, with vessels of the first class, the service to begin October 1, 1894. This bid was offered for the Columbia Safety Steamship Company, by George Meacom, president. The enterprise is a new one, and little seems to be known of it. The bid is for weekly service—52 trips a year.

Marshall Bros. & Co.

Marshall Bros. & Co., at their galvanizing works, Front street and Girard avenue, Philadelphia, have in place two sets of tinning machines. The pot for making bright plates, which has been successively operated, is known as the Leyshon pot, made according to the designs patented by George Leyshon & Son, Tipton, England, whose pots are in use in several European tin plate works. The machine is so constructed that the sheet enters a bath of tin through a flux funnel, is taken out from the first pot, put through another grease funnel into a pot holding tin in the bottom and covered with a layer of palm oil. The sheet comes out of the second pot between rolls driven by power, and in the complete machine of this kind, which is especially adapted for long sheets, the sheet will pass through a cleaning machine. With this pot some finely coated bright plates have been made, plates that will compare very favorably indeed with the imported article. In the pot now in operation at the works, where terne plates are made, the sheet passes through a single bath of the terne mixture covered with grease, the pot being a modified form of the Leyshon apparatus. The sheets at present are made in large sizes, 20 x 84 inches of IC or 30 gauge. The sheets are stamped "Penn Treaty" and appear to be heavily and thoroughly coated, with a smooth surface. The capacity of the present pot is about 4 tons per day. The pickling of the plates is at present done in the galvanizing works, but arrangements are being made to do the pickling at the rolling mill of Marshall Bros. & Co., which is located at Beach and Marlborough streets, Philadelphia. At the rolling mill the black sheets are rolled down from the Bessemer steel, and also cold rolled. The mill is now being remodeled and equipped with new sets of rolls for rolling in packs and cold rolling. Some of the new rolls are now in operation and others are being made.

Cost of Tinning Machines.

We are indebted to Clarence R. Britton, acting secretary of the Tinned Plate Manufacturers' Association of the United States, for some interesting figures respecting the cost of tinning plants. Mr. Britton writes that he erected two Morewood tinning stacks, built the Morewood five-roller machines from detailed drawings, and had pots cast from his own patterns, and the exact cost of erecting one Morewood stack with five-roll machine complete, suitable to make either 20 x 28 inch or 14 x 20 inch plate, was as follows:

One Morewood five-roller machine....	$350.00
7000 castings (pots), at 3 cents..	210.00
3000 castings (hearth plates), at 2 cents	60.00
14,000 red brick, at $6.....	84.00
1500 Dover fire brick, at $26....	39.00
40 bushels of lime, at 22 cents.....	8 80
2 barrels cement, at $1.....	2.00
2 barrels fire clay, at $1.50.....	3.00
Anchor rods, bolts, nuts, furnace doors, iron plates for oil burners..	25.00
Sheet iron hood and stack.....	65.00
1 mason 15 days, at $5.....	75.00
1 helper 15 days, at $2.....	30.00
Total.....	$951.80

This includes everything except oil or gas burners, piping for burners and tongs, &c , for tinman and washman.

For bright plates, four oil burners, at $25.....	$100.00
For terne plates, three oil burners, at $25.....	75.00

The World's Merchant Marine in 1891.

There are two important mercantile compendiums of shipping, "Lloyd's Register" and the "Bureau Veritas." The first is said to date from the year 1700, the second was begun in more modern times and was started as a formidable rival to the older publication. Both compendiums are issued under the direction of associations organized for the purpose of insuring ships and cargoes, and the information contained in their books is of such a character as to let underwriters and ship owners know that a vessel has been inspected and built according to the rules of the society, and that she, therefore, has a certain standing as to perfection of hull and equipment.

Lloyd's Register is an English publication, Bureau Veritas is French. The 1891-92 edition of the latter publication is at hand, and from its pages many interesting facts as to the merchant fleets of the world can be obtained.

Of the steam vessels of the world of a net tonnage of and greater than 100 tons, it is found that there is a total number of 10,103, representing a gross tonnage of 13,805,028 tons and a net tonnage of 8,872,394 tons. Of sailing vessels there 31,666, of a collective net tonnage of 10,217,909 tons.

Before proceeding it may not be out of order to define the two kinds of tonnage which are indicative of the size of vessels. By gross tons, or register tons, as they are sometimes called, is meant the entire internal cubical capacity in tons of 100 cubic feet. By net tons is meant the absolute carrying capacity of a vessel—that is, the number of tons of cargo she will carry, allowances being made for machinery space and other permanent fittings that take up room and prevent the stowage of cargo.

According to Bureau Veritas the English flag is represented by 5471 steamers of a gross tonnage of 8,536,994 tons, corresponding to 5,369,952 net tons, and by 9751 sailing vessels of an aggregate net tonnage of 3,503,524 tons. Next comes the American flag with 456 steam vessels of 598,847 gross tons and 417,138 net tons, and 3504 sailing ships of 1,519,114 net tons The Norwegian flag follows with 3419 sailing vessels of 1,393,481 net tons, and 440 steamers of 310,624 gross tons and 221,202 net tons. Then comes Germany with 761 steam vessels of 1,083,307 gross tons and 762,195 net tons, and 1480 sailers of 654,147 net tons. Next in order is the French flag with 488 steamers of 843,486 gross tons and 500,516 net tons, and 1573 sailing ships of 286,114 net tons. Next is Italy with 206 ships of steam of 313,306 gross tons and 199,153 net tons, and 2010 sailing vessels of 586,984 net tons, and so on.

By adding the net tons of the sailing vessels to the net tons of the steam vessels it is seen that the United States occupy the second place, England only being ahead, while Norway, Germany, France and Italy follow in the order named. In the matter of steam tonnage alone the order of seniority is as follows: England,

Germany, France, United States, Norway and Italy.

If the merchant fleets of the principal powers of the world be arranged according to the tonnage of the sailing vessels the order will be as follows: England, United States, Norway, Germany, Italy and France.

By glancing over some of the editions of the Bureau Veritas for the past few years, it is observed that next to Great Britain, Germany has made the most rapid progress. In the year 1885 her steam tonnage amounted to but 566,697 gross tons; to-day it is 1,083,307 gross tons. Two years ago the German merchant fleet passed the French fleet, and that in the face of the larger subventions and navigation bounties granted to ships flying the tricolor.

Turning to the back part of the Bureau Veritas there is found a list of vessels and the names of the corporations owning them. If this list be taken and the tonnages of the ships be added to it, an interesting table of the principal steamship lines of the world can be made out. Such a list is the subjoined:

Name of company.	Number of steamships.	Gross tons.
Norddeutscher Lloyd (Bremen)	66	221,603
British India (Glasgow)	91	99,096
Messageries Maritimes	62	192,631
Peninsular and Oriental	48	187,684
General Transatlantique	64	165,635
Navigazione Generale Italiana	105	161,687
Wilson Line (Hull)	84	147,162
Hamburg-American	44	136,659
Allan Line	42	130,156
Austrian Lloyd (Trieste)	76	123,565
Pacific Steam Navigation Company	34	96,524
Spanish Transatlantic	32	95,207
Cunard Company	24	85,391
Anchor Line	29	81,067
Ocean Steamship Company (Glasgow)	42	77,515
Royal Mail (London)	24	76,314
Chargeurs Réunis	20	73,621
Donald Currie (London)	25	67,391
Leyland (Liverpool)	26	65,760
South American (Hamburg)	28	60,731
Union (New Zealand)	52	54,919
Russian Navigation Company (Odessa)	50	54,532
Det Forenede (Copenhagen)	12	53,463
Pacific Mail (New York)	18	50,040
Netherlands American	12	39,504
La Véloce (Genoa)	14	39,502

There are many other interesting facts to be gathered from the pages of this excellent publication. For instance, there is a table of steam vessels classified according to their tonnage. Briefly summed up this table presents the following figures concerning the steam tonnage of the world: There are 315 vessels from 300 to 3500 tons; 197 from 3500 to 4000 tons, and 263 of a greater tonnage than 4000. Among those of greater tonnage there are 15 steamships from 6000 to 7000 tons; eight from 7000 to 8000 tons; six from 8000 to 9000 tons; two from 9000 to 10,000 tons, and two from 10,000 to 11,000.

The following is a list of the great steamships of the mercantile navies of the world of a larger tonnage than 6000 tons register:

City of Paris	10,499	Aurania	7,269
City of New York	10,499	Friesland	7,166
Majestic	9,861	La Bretagne	7,112
Teutonic	9,686	La Champagne	7,087
Fürst Bismarck	8,874	Kaiser Wilhelm	6,990
La Touraine	8,863	Havel	6,963
Normannia	8,144	Spree	6,963
City of Rome	8,144	Alaska	6,932
Umbria	8,128	Scot	6,814
Etruria	8,120	Polynesien	6,483
Augusta Victoria	7,761	Australien	6,428
Columbia	7,758	La Normandie	6,283
La Bourgogne	7,395	Victoria	6,091
La Gascogne	7,283	Britannia	6,061

The ships of this large fleet fly the following flags: Twelve the red ensign of St. George; 8 the tricolor of France; 7 the German flag, and one the Belgian. Twenty-four of them sail out of the port of New York. The remaining four go to China or Australia.

The *Ironmonger* reports that several cargoes of hematite iron ore have been sold to American furnacemen. Our contemporary attributes the sales to low freights caused by the heavy tonnage of grain vessels. This undoubtedly has a tendency to stimulate shipments, but as a matter of fact we receive annually a certain moderate quantity of English Bessemer ore, chiefly Hodbarrow.

Corrosion and Breakage of Water-Gauge Glasses.

BY G. D. HISCOX.

The uncertain quality of water-gauge glasses and their liability to crack and burst is always a source of apprehension with engineers and firemen. The most important part of a water gauge is the glass tube, and upon the perfection of its make and composition depends the confidence with which it is viewed. The defects arise principally from the composition and imperfect annealing, which leaves an unequal strain upon their outer and inner surfaces. Another defect is the gradual weakening of the tube by the solubility of the glass in pure water at the high temperature due to the pressure of steam carried in the boiler.

Before the introduction of the Scotch kelp glass tubes to the American market water-gauge glasses were made from tubing of Bohemian, crown or flint glass, as convenient; their durability being very uncertain from the brittleness of the Bohemian glass under changes of temperature and the extreme solubility of the flint glass in contact with high-pressure steam. The crown glass was better, but could not always be had in tubing. The introduction of the Scotch kelp glass tubes has made the conditions of breakage and wear more uniform, but with no apparent gain on the soluble properties of the glass.

Thus, by a series of experiments, flint glass has been found readily soluble under a pressure of from 300 to 600 pounds per square inch, at a less temperature than that of boiling water. Other experiments have shown that pure water as it condenses from steam at high temperatures and pressures is an active solvent of glass in a degree dependent upon its composition, the greatest affinity being toward the kind of glass containing the greater portions of potash or soda.

Several theories have been named to account for the wearing away at the top and the streaks down the inside, which generally terminate at the water level of the gauge glass. Friction of the water of condensation carrying particles of iron, rust and dirt is the most plausible, but it does not account for the eating away of the outside of the tube at the top, where it projects above the rubber packing and into the chamber of the water-gauge head. This projection forms a small cistern around the top of the tube, which is a receptacle for the water of condensation on the inner surface of the gauge head at a constant temperature and pressure due to the boiler pressure, and which is constantly filling and overflowing and running down the inside of the tube. There being no friction worth consideration in the little cistern around the top of the tube, the only tenable theory for so great a waste of glass at this point must be found in the soluble power of pure water at the temperature and pressure in the boiler, and that pressure is the potent influence in the process. In support of this last point, we may point to experience with low-pressure heating apparatus, for gauge glasses that have been in use for several years on low-pressure boilers of less than 5 pounds pressure have been removed with scarcely a mark of corrosion.

The cracking of water-gauge glasses may be mainly attributed to the tension of the glass on the inside surface by faulty annealing, as this is shown by the fact that a slight scratch around on the inside surface at the proper place will produce a crack following the scratch. This is the method used for breaking the tubes to the proper length for use, while if the scratch is made on the outside of the tube it does not crack at the scratch naturally, and if pressure or a light tap is used to start the crack it will break just where not wanted. This very plainly shows that there is compression on the outside and tension on the inside surface of the tube.

This is also manifest in the care necessary in cleaning the tubes by wiping, as every engineer knows by teaching or experience of the final cracking or splitting of the tube when an iron rod or wire is used for pushing the wad through the tube. Unless the whole rod is wound with a strip of cloth to prevent scratching the contact from a scale or particle of grit may make a scratch that cannot be seen by the eye, but will soon split the tube when exposed to changes of temperature in the water gauge. In this way a very curious phenomenon has been observed in the cracking of tubes in a spiral line for the greater part of their length. The cause of this has been traced to the fact that the construction of the water-guage heads sometimes produces a whirl in the steam inside of the glass, when it is blown off at the bottom. Any scale or other hard substance from the inside surface of the top connecting pipe partakes of the whirling motion of the steam, and the centrifugal force presses the particles against the inside surface with sufficient force to produce a spiral scratch not noticeable at the time, but soon starts a crack that, as has been observed, ran on a spiral more than once around the tube.

Another source of trouble by breakage is from unequal expansion between the glass and the iron work, especially if the water-gauge heads are screwed directly into the shell of a vertical or locomotive boiler. The expansion and contraction of the boiler plate is about 40 per cent. greater than that of glass for even changes of temperature; but as the glass tube below the water line may be somewhat cooler than the boiler plate, the difference in expansion may be greater than here stated. This strain constantly changing from day to day or week to week, presuming that the rubber packings have become hard or vulcanized to the glass, as is often the case, the contact becoming closer and with a longer bearing, from the screwing of the suffing boxes too tight at first, or following up the cap to stop leaks, makes an immovable connection between the glass and the gauge head that finally throws the whole strain from expansion upon the tube, which with the natural tension upon the inner surface pulls the tube apart.

When water gauges are placed on columns of cast iron free from contact with the boiler, except by their connecting pipes, and care is used in squeezing the rubber packing rings lightly or only just enough to prevent leakage, there is far less trouble from breakage. By this arrangement the cast-iron column is kept slightly cooler by the slower circulation of the inclosed water, and the cast iron also having a slightly less expansion than wrought iron for given changes in temperatures, makes this method of water-gauge connection much the most reliable for safety as well as the steadiest indication of the water level in the boiler.

Where water gauges are connected to the cast-iron front with pipe connections to the boiler corrosion of the gauge glass seems to be largely increased, as observed, and also from the fact of the increased flow of hot water and iron rust through the glass from condensation in the usually bare pipe from the boiler. This is relieved in a great measure by the use of the independent stand pipe, which should be required by purchasers of boilers of any style in use.

OBITUARY.

JOHN H. LICK.

John H. Lick, only son of James Lick, the California millionaire who gave the great Lick Observatory to the State of California, died at his home at Lickdale, Lebanon County, Pa., on the 22d inst., aged 73 years. He was unmarried and was president of the Lickdale Iron Company and the Ellendale Forge in Dauphin County, and was an extensive real estate owner in Berks, Dauphin and Lebanon counties.

HENRY B. NORTON.

Henry B. Norton died at Norwich, Conn., Sunday evening, aged 84 years. He was one of the most prominent business men in Eastern Connecticut, being closely identified for most of his life with the business, educational and religious welfare of the community. He was at the time of his death president of the Attawaugan Mfg. Company and of the Norwich Free Academy, and a director in the People's Line of steamers (between New York and Albany), the Norwich Bleaching Company, the Richmond Stove Works, the Bulletin Company and other corporations.

S. A. FULLER.

S. A. Fuller, president of the Union Rolling Mill Company of Cleveland, Ohio, died in that city suddenly on the 23d inst. He was born in Trumbull County, Ohio, and came to Cleveland about 40 years since, at the age of 15. He was well known in business circles, and besides being president of the Union Rolling Mill Company was director of the Central National Bank, and was connected with other business enterprises.

CHRISTOPHER WRAY,

who was for a long time identified with the hardware trade in new York, died October 23, in the 75th year of his age. Mr. Wray was a native of England, coming to this country in early youth, eventually engaging in the hardware business, in which he continued until about three years ago. He was a well-known member of the Society of Friends. His funeral was attended by many representatives of the hardware trade.

The Central Expanded Metal Company, Pittsburgh, Pa., manufacturers of steel lathing and fencing, are quite busy and shipping their goods to all parts of the country as fast as turned out. Among some of the numerous contracts which they have on hand may be mentioned the contract for all the lathing used in the new building now in course of erection by the Germania Savings Bank, located on the corner of Wood and Diamond streets. This firm also supplied the lath for the new Telephone Exchange Building in Pittsburgh, Pa., which is about completed, and are furnishing the lath for a fine stone residence now being erected on Highland avenue, Pittsburgh, by Oswald Warner. Harvey B. Chess of the firm has about completed the erection of a residence on Wightman street, Pittsburgh, the exterior of which is made of cement in imitation of stone. The cement work is so neatly done that it will require an expert to detect the difference between this work and that of real stone. The cost of a building erected in this manner, as compared with a solid stone building, is claimed to be one-third less.

The locomotive builders of the country held a meeting this week at the office of the Cooke Locomotive and Machine Works in this city to discuss plans for an association, and the question of establishing more remunerative prices. The business has been woefully demoralized for a year.

MANUFACTURING.

Iron and Steel.

The Lukens Iron and Steel Company of Coatsville, Pa., have finished a gas-making plant and are erecting two open-hearth furnaces. The puddle mill has shut down and will be turned into a light sheet mill.

It is announced that New Brunswick and Nova Scotia parties will build a charcoal iron furnace near New Glasgow, Nova Scotia. A large deposit of high-grade ore has been opened up, and application is to be made to the Government for letters patent.

The creditors of the McCosh Iron and Steel Company, at Burlington, Iowa, have brought suit for the appointment of a receiver and the sale of the property to satisfy a mortgage on a trustee's deed to the amount of $225,000, and interest since September 1, 1890.

The new works of the Alabama Rolling Mill Company, Birmingham, which were destroyed by fire last June, are about completed, the puddle mill has started up full time and the finishing mill will resume in about two weeks. Seven new puddling furnaces and two gas-heating furnaces have been added to the plant, which will increase the output to about 80 tons of finished iron per day.

Cedar Point Furnace, at Port Henry, N. Y., has blown in on Bessemer pig.

James Hemphill and H. C. Fownes have been appointed receivers of the Hainsworth Steel Works, Pittsburgh.

The National Forge and Iron Company's rolling mill property at East Chicago, Ind., was sold by the receiver on the 22d inst. to Weaver, Getz & Co. of Chicago, who paid $17,000 for the material on hand and $34,600 for the plant, making a total of $51,600. The works cost about $250,000, and were built less than two years since. Weaver, Getz & Co. are coal merchants, and were large creditors of the company. The result of the sale is not viewed with complacency by the other creditors, and it is probable that a vigorous fight will be made to have the transaction nullified. It is claimed that the notice of the date of sale was too short to enable wide announcement of the fact and an examination of the property by parties proposing to bid on it.

The Shelby Steel Tube Company, Shelby, Ohio, who started the manufacture of cold drawn steel tubing July 24, 1891, report that since starting there has not been a single hitch in their operations. They are supplying all the leading manufacturers of bicycles, their product standing the severest tests. The present capacity for producing average sizes is about 12,000 feet per week, which they hope to increase to 18,000 feet by January 1, 1892 The material used is Swedish steel billets, and the tubing ranges from No. 8 to 18 and lighter in guage, and from ⅝ to 1¼ inches in diameter, running in length from 2 to 18 feet. The plant and building occupy ground space of 100 x 150 and 100 x 30 feet. To this will be added 100 feet more.

No. 1 furnace of the Bristol Iron and Steel Company, Bristol, Va., a new stack, has blown in.

The furnace of the Oxford Iron and Nail Company, at Oxford, N. J., has blown out. The furnace had been in operation for about six years.

The Haselton Furnace of the Andrews Bros. Company, at Youngstown, Ohio, has shut down for relining and general repairs.

The assignees of Harrison Loring, proprietor of the City Point Works, Boston, have made a statement of the assets and liabilities. The latter are placed at $342,891.51, and the assets, based upon what the different classes of assets would be worth in case the business should be continued, are given as $563,296.21.

Charles B. Froment, assignee of the Blandon Rolling Mill, reports that the estimated assets are $70,000 and the liabilities $65,000.

The litigation over the settlement of the affairs of the Worcester Steel Works, Worcester, Mass., has been brought to a close by the payment of $200,000 to the assignees of the insolvent estate on behalf of a new corporation, which will be organized and known as the George M. Rice Steel and Iron Company. It is said that the money was advanced by a New York syndicate, who are to take bonds of the new corporation as security, and who are also willing to advance money as it is needed to furnish working capital. The greater bulk of the stock of the new concern will be owned by Hon. George M. Rice, who was the president of the old concern. It is as yet undecided whether to resume business at the works at Worcester or to erect a new plant at Portsmouth, R. I., where the company own a coal mine and a large tract of land.

Announcement is made that the new sliding scale for the Edgar Thomson Steel Works, at Bessemer, Pa., which is to go into effect on the first day of the new year, has been satisfactorily settled between Chas. M. Schwab, general superintendent of the plant, and the men in all the departments. The entire scale is in the hands of the firm, but it is said will not be made public until the men have signed it. It is intimated that the reductions made were not as great as the men expected and for this reason it is thought the men will sign the scale as soon as it is presented to them.

Carnegie, Phipps & Co., Limited, have erected three handsome dwelling houses on their City Farm property, adjoining the Homestead Steel Works, at Homestead, Pa. They are intended for the use of the heads of the various departments in that plant.

In the courts of Pittsburgh last week, A. E. McCandless, sheriff of Allegheny County, secured a verdict for $4248.95 against the Allegheny Bessemer Steel Company, whose plant is located at Duquesne, Pa., and is now owned and operated by Carnegie Bros. & Co., Limited. The amount awarded includes the interest, and is to compensate the sheriff for services rendered at the defendants' works during a strike. The verdict is subject to the opinion of the court on a question of law reserved as to the liability of the county for the pay of deputy sheriffs on such occasions when riot is to be anticipated.

The Pittsburgh Bridge Company of Pittsburgh have commenced the shipment of 250 tons of material to be used in the construction of the bridge of the Great Northwestern Railroad Company to be erected over the Mississippi River, at Minneapolis, Minn.

Secaucus Furnace, at Secaucus, N. J., has gone into blast on special iron.

One day recently the 10-inch mill of the Trumbull Iron Company, at Girard, Ohio, owned and operated by the Youngstown Iron and Steel Company of Youngstown, Ohio, made an extraordinary large run at one furnace of this mill. The output was 47,696 pounds, which is claimed to be the largest output of one single furnace in the Mahoning Valley in the same length of time. It is announced that this firm are tearing out their double puddling furnaces and will replace them with single ones

For some time past negotiations have been on foot looking to the establishment of a tin-plate plant at Blairsville, Pa., located at the intersection of the West Penn Railroad and Allegheny Valley Railroad. A meeting of those interested was held in Blairsville recently, and a committee appointed to procure a charter. A board of directors was also appointed consisting of the following persons: T. D. Cunningham, Jas. A. Graff, D. M. Fare, Paul Graff, J. M. Devers, J. M. Harvey and R. W. Werble. It is said the new company propose to invest about $75,000 in the plant, and will give employment to a large number of hands. Several constructing firms in Pittsburgh are understood to be bidding on the machinery.

The work of relining the blast furnace of the Bellaire Nail Works, at Bellaire, Ohio, is about completed, and the furnace will resume operations early in November. The Bessemer steel plant of this firm has been shut down for a few days on account of a demand of the machinists for more pay for Sunday work. This is not the custom in other steel plants, and the firm refuses to accede to the demand of the men. It is expected that new men will be secured to take the place of the strikers, and the plant will probably resume operations during the present week

Machinery.

Watson & Stillman of New York have recently added 5000 feet to their works, thereby greatly facilitating the production of hydraulic tools. The output of hydraulic jacks and car wheel presses during the last two years has increased to such an extent that the adoption of this course was rendered absolutely necessary in order to keep abreast with their orders.

Belknap Motor Company, Portland, Maine, have an exhibit of their Cyclone mills and Little Giant water motors at the Food and Health Exhibition at Boston. The machines are shown in operation.

P. B. Perkins of Los Angeles, Cal., proposes to establish a works at San Diego for the manufacture of mining machinery, hydraulic pumps, traction and stationary engines and iron and steel work generally The estimated cost of the plant is $150,000.

The Smith-Silk Machine Tool Company, Kenton, Ohio, producing shapers and planers, although in their new shops only since last May, find it necessary to increase their present extensive facilities by the addition of more machinery, which is now on the way. The company will probably add one or two extra

sizes to their present line of planers and hope to be in position to furnish the trade with them by January 1, 1892.

The Riehlé Brothers Testing Machine Company of Philadelphia have completed a vertical 100-ton screw-power testing machine for the School of Practical Science at Toronto, Canada. The machine is made with two movable crossheads and will test by tensile strain specimens from 10 feet down to 6 inches long, transverse specimens from 18 feet to 1 foot and compression specimens from 12 feet down.

The Connell & Dengler Machine Company, capitalized at $10,000, have been incorporated at Rochester, N. Y. The object of the company is to manufacture and sell machinery and machinery supplies, and to operate a foundry.

A bill in equity was filed in the Common Pleas, Philadelphia, 22nd inst., by J. Howard Lanning, administrator of James Lanning, deceased, against A. H. Hamilton, H. F. Manges, C. H. Otterson, F. B. Lanning and the Perseverance Iron Company, in which is asked an accounting of the transactions of James Lannigan with Mr. Hamilton and also with the partnership and the corporation affairs in all their details. The Court is also asked to appoint a receiver.

The Flenniken Turbine Company of Dubuque, Iowa, propose to enlarge their plant.

The Greenfield Boiler Company's works, at Greenfield, Mass., have been sold to Utica, N. Y., parties, to which place the plant will be moved

The Monterey Foundry and Machine Company have been chartered to do business at Monterey, Mexico, and Hutchinson, Kan.

Creswell's Iron Foundry, Philadelphia, is to be removed to a new site, where a two-story brick structure 190 x 70 feet is being erected.

L. S. Bonbrake proposes to establish a plant at Nebraska City, Neb., for the manufacture of steel roofing and other iron building materials.

Wm. Sellers & Co., Incorporated, will erect an addition, 80 x 78 feet, to their plant at Sixteenth and Buttonwood streets, Philadelphia.

Wm. Tod & Co. of Youngstown, Ohio, have received an order from the Riverside Iron Works, Wheeling, W. Va., for a 36 x 48 inch engine for running the machinery of the new plate mill now being erected by the latter firm.

The Trethewey Mfg. Company of Pittsburgh have just about completed the erection of a new hammer shop and have placed in it a 5000-pound hammer of their own construction. A testing furnace has also been built, and the company will make all their own steel forgings and also do work for general trade, making light and heavy steel forgings up to 3000 pounds in weight.

The Lewis Foundry and Machine Company, Limited, of Pittsburgh, are erecting a new foundry department. The old building has been torn down and an iron building 95 x 100 will be substituted.

The Inventors' Mfg. Company of Youngstown, Ohio, have been granted a charter, with a capital stock of $1000. The incorporators are: E. M. Taylor, C. E. Walton, L. T. Tyrrell, B. F. Campbell and Fred. C. Brown, all of Youngstown. The object of the company is to manufacture and sell novelties.

The American Spiral Spring Company, Pittsburgh, Pa., are manufacturers of all kinds of spiral springs and also deal in all kinds of wire. The firm also make a specialty of street car and automatic engine springs. The concern have been located in Pittsburgh for two years now and have succeeded in building up a large business. They are running full time

Thos. Carlin's Sons, founders and machinists, of Allegheny, Pa., made one of the largest shipments of clay-grinding machinery last week that ever left Pittsburgh. The weight of the shipment was 86,000 pounds, and it was sent to a new fire clay concern in Kentucky for grinding clay to be used in the manufacture of fire brick.

Hardware.

Derby & Ball, Bellows Falls, Vt., report that their new buildings are in an advanced stage of completion, and they expect to be again making snaths by the first of November.

The Kenton Lock Mfg. Co. Kenton, Ohio, although not quite a year in operation have found it necessary to largely increase their productive capacity by the erection of new buildings, including office building, pattern vaults, &c., all of which when completed will add to their capacity 50 per cent. They allude to the fact that they are very busy, and in order to fill orders are operating the present plant 14 hours daily, and will continue doing so until the additions referred to will have been completed. A new catalogue of 200 pages is now in course of preparation and it is expected will be ready for distribution by January 15, 1892.

Under date October 16, announcement is made that Eli S. Godfrey has retired from the firm of A. B. See Mfg. Co., 116-120 Front street, Brooklyn, N.Y., and that the remaining partners, Alonzo B. See and Walter L. Tyler, will continue the business under the same firm name.

Miscellaneous.

Main Belting Company of Philadelphia in addition to their branch in Chicago, have found it desirable to establish one in Boston, and have located at 120 Pearl street, in that city, and will there carry a full line of the Leviathan belting. The demand for this belting comes from all parts of the Union, but is making special gains in New England, so that it will be a great accommodation to the trade in that section of the country to be able to secure spot deliveries.

Reese, Hammond & Co., fire-brick manufacturers of Bolivar, Pa., are to furnish the brick for the hearth, bosh and lining of the Stewart Iron Company's new furnace, at Sharon, Pa. This furnace is to be one of the most modern improved structures in the country. It is 16 x 75 feet.

The Aluminum Alloy Metal Company of Hampton, Iowa, have been incorporated, with a capital of $25,000.

The Hurst Ordnance Company, capitalized at $1,000,000, have been chartered at Alexandria, Va. The company was organized to manufacture rapid-firing guns, cartridges, &c.

The Crane Company, iron and pipe manufacturers, at Chicago, have begun suit in the United States Supreme Court against the Columbus Construction Company of New Jersey for $300,000 damages, and an attachment was also issued against the company on a claim by the plaintiff for $103,715 due the Crane Company for iron pipe furnished.

J. S. Hibbs has assumed the management of the Chicago Foundry Supply Company, Chicago, Ill., in connection with H. F. Frohman, secretary and treasurer, and J. Wasmer, superintendent. Mr. Hibbs has been connected with the foundry business as molder and foreman for 22 years, and in the facing and supply business for the past 8 years.

Recently authorized corporations in Illinois are as follows: The Calumet White Lead and Color Company, at Chicago, to manufacture white lead, paints, &c.; capital stock $1,000,000; incorporators, W. J. Aiken, E. D. Scott and J. C. Packard. The Prescott Steam Heating Company, at Chicago, to manufacture car heating apparatus; capital stock $150,000; incorporators C. C. Poole, A. H. Graves and G. A. Prescott. The Thayer and Britton Company, Chicago, to manufacture car and locomotive bearing and railroad supplies; capital stock $100,000; incorporators, F. W. Thayer, F. H. Britton and Louis Danziger. The Speedy Cycle Mfg. Company at Chicago, to manufacture bicycles; capital stock, $50,000; incorporators, Henry J. Winn, S. H. Percy and W. A. Doyle. The Lewis Valve Gear Company, at East St. Louis, to manufacture valves, pumps, &c.; capital stock $600,000; incorporators, W. J. Lewis, L. B. Fisk and E. S. Marshall.

The Champion Iron Company, Kenton, Ohio, are enjoying an exceptionally good trade. They have placed 15,000 feet of fencing in the Forest City Cemetery, at Buffalo, N. Y.; 2600 feet have been shipped to Honolulu, Hawaian Islands, for the Queen's palace, and shipments aggregating 17,000 feet have been made to Pittsburgh, Pa; Minneapolis, Minn., and Winchester, Ky. The company have recently brought out some very attractive designs for entrance gates and fencing.

The Navy Department has been notified by the Columbian Iron Works of Baltimore, Md., that the new 2000-ton cruiser, No. 10, is ready to be launched. The cruiser is one-sixth larger than the Yorktown and will be more speedy and carry a heavier armament.

San Diego, Cal., papers are excited over a "proposition of immense magnitude" which has been submitted by C. L. Hubbs, who is said to be a mine owner and the possessor of a large area of Arizona coal and timber lands. The scheme is to establish on the bay front at San Diego a plant for the manufacture of iron ships, including iron passenger vessels and merchantmen, and Government cruisers if contracts can be secured. It is proposed to convert the ore into pig iron at the mine, using coke as a fuel, and to ship it to San Diego where it will be converted into the manufactured product. The cost of the entire plant is placed at $3,000,000. It is further announced that associated with Mr. Hubbs is a company owning a plant at Pittsburgh, Pa., for the manufacture of locomotives, which it is proposed to move to San Diego, where the building of locomotives will be carried on on a large scale. In addition to all these enterprises the promoter also proposes to establish rolling mills at San Diego for the special manufacture of steel rails.

On the 22nd inst. the State Department of Pennsylvania issued charters to the following corporations. The McKeesport Fuel and Light Company, of Pittsburgh, capital stock, $10,000; directors, R. C. McLean, H. Sellers McKee, J. G. Ormsby and J. D. McCabe of Pittsburgh, and Wm. D. Hartupee of Charleroi. The Esplen Fuel and Light Company of Pittsburgh, capital stock, $10,000; same directors. The Homestead Fuel and Light Company of Pittsburgh; same directors; capital stock, $10,000. The Mansfield and Chartiers Fuel and Light Company of Pittsburgh; same directors; capital stock, $10,000.

A meeting of the stockholders of the Allegheny Heating Company, suppliers of natural gas, was held in Allegheny, Pa., last week. The following board of directors was elected: Geo. Westinghouse, Robt. Pitcairn, Jno. Caldwell, A. Groetzinger, Calvin Wells, J. R. McGinley, Thos. Rodd, Wm. F. Lloyd, Thos. A. Park, Jas. McCutcheon and Herbert DuPuy. Immediately after the election the board organized by electing Geo. Westinghouse, president, and Jno. Caldwell, secretary and treasurer. The following persons were formerly directors of this company, but were dropped at the above meeting: Adison Lisle, Wm. Walker, Dr. W. J. Langfitt, Geo. H. Brown and Robert Young. This company is now practically under the direct management of the Philadelphia Natural Gas Company of Pittsburgh, who have held the majority of the stock for the past four years, although they never assumed control of the board of directors.

For the week ending October 19 the rod mill deparment of the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., made the largest run on record. The gross run was 1247 tons of rods, the finished product being 1133 tons. This mill also made what is claimed to be the largest output in one turn ever made in this country, amounting to 324,550 pounds.

Suit Against the American Bridge Manufacturers' Association.

The suit of the Phœnix Bridge Company against the Keystone Bridge Company and several other concerns composing the American Bridge Manufacturers' Association was before Judge Beach in the Supreme Court Special Term last week. At the time the association was formed a guarantee fund, to be used in carrying out its purposes, was started by the levying of an entrance fee of $52,000 upon all the members, to which the Phœnix Bridge Company and the Union Bridge Company each contributed 16 per cent.; the Keystone Bridge Company 10 per cent., and the remaining ten concerns in the association from 9.75 per cent. down to 2.1 per cent. This fund was to be increased from the first receipts until its amount became $260,000, no surplus assets to be distributed among members until this amount had been reached. The Phœnix Company's interest was $40,000, and the company feared expulsion for declining to pay an assessment of $33,202.78 made upon iron furnished by them in constructing the Fulton Elevated Railway in Brooklyn.

The company constructed the King's County Elevated Railway, and by resolution of the Manufacturers' Association were exempted from the payment of the customary assessment of $\frac{1}{16}$ cent per pound upon the iron furnished in the construction of the King's County road up to 40,000,000 pounds. The Phœnix Company claim that the Fulton railroad was constructed by the same syndicate and was a continuation of the King's County road, and that therefore the assessment was invalid. In February of last year an injunction was obtained by the Phœnix Company restraining the association from doing anything detrimental to the interests of the plaintiffs in the association. In the present suit no decision has yet been rendered.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 28, 1891.

This market continues very irregular. Some clases of finished products are weaker than they have been, while others are firm. Prices in no case show an advance over previous quotations, but in some instances a decline is noted. Here and there a house reports increased sales, but they are exceptions and not the rule.

Pig Iron.—Coke Foundry Irons are in moderate demand, both for the local and Southern brands. This is due to the peculiar condition of the jobbing foundries, whose trade keeps up very well, but without prospects ahead further than a few days or a week at most. While the foundrymen are hopeful that work will continue to come in, they are not disposed to buy much Pig Iron in anticipation. Hence they order in small quantities and often. The foundries running on specialties are in better shape, and good reports of increasing business come from them. From this class of consumers inquiries are coming for deliveries running through the whole of next year. Sellers on such terms at current prices are not so numerous as they were, because the prospects of higher prices next year are growing better and it takes considerable canvassing of the trade to find a furnace company willing to contract for delivery beyond next May, except at an advance. Lake Superior Charcoal has been quiet the past week, but the market is being sounded by large consumers, who would evidently place contracts for next year's delivery at present rates if they could induce the makers to accept them. Quotations are as follows, f.o.b. Chicago:

Lake Superior Charcoal	$17.00 @ $17.50
Local Coke Foundry, No. 1	15.50 @ 16.00
Local Coke Foundry, No. 2	15.00 @ 15.25
Local Coke Foundry, No. 3	14.50 @ 15.00
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	17.75 @ 18.25
Southern Coke, No. 1	15.75 @ 16.25
Southern Coke, No. 2	15.00 @ 15.25
Southern Coke, No. 3	14.25 @ 14.50
Southern, No. 1, Soft	15.00 @ 15.75
Southern, No. 2, Soft	14.50 @ 14.75
Southern Gray Forge	14.00 @ .....
Southern Mottled	13.50 @ 14.00
Tennessee Charcoal, No 1	18.00 @ .....
Alabama Car Wheel	20.50 @ 21.50
Coke Bessemer	17 00 @ .....
Hocking Valley, No. 1	17.00 @ 18.50
Jackson County Silvery	17.50 @ 18.00

Spiegeleisen.—Negotiations for considerable Spiegel are under way. Local makers have competed recently for business at tidewater points, but found foreign offered at lower prices than they could reach. Quotations are unchanged.

Bar Iron.—Manufacturers' agents are receiving orders for lots of 100 to 300 tons, but they are mainly from Northern lake points, to which shipments are being hurried before navigation closes. Generally speaking, the Bar Iron trade is quiet, with but little business in sight. The Ohio makers quote 1.60¢ at mill, half extras, or 1.75¢ here, which seems to be about the rate made by manufacturers of other localities who reach this territory.

Structural Iron.—But little of importance has developed during the week; bridge work is light and new building contracts are slow to take shape. Angles are somewhat stiffer, but can still be bought at 2.05¢, Chicago, from mill. Tees depend on specifications, and range from 2.40¢ up. Universal Plates are quoted at 2.12½¢ upward. Beams and Channels are unchanged.

Plates.—Mill agents report the Plate trade in worse shape than was ever before known here. A large contract for Shell Steel was made at Racine last week, which was taken by an Eastern Pennsylvania mill at figures considerably below those bid by Pittsburgh. A large order was placed for Boiler Tubes at the same time, and much curiosity exists as to the works taking it, since the presumption obtains that somebody cut the combination price. Carload lots of Steel Plates are quoted as follows, Chicago: Tank, 2.10¢ @ 2.12½¢; Shell, 2.30¢; Flange, 2.50¢. Store business is light, but prices are unchanged.

Sheets.—Standard Black Sheets are dull, the demand for mill lots being confined mainly to thin gauges and special qualities. No. 27 Common is unchanged at 2.95¢, Chicago. Jobbers quote 3.20¢ from store, but this price is not firmly held, as some are anxious to make their stock move off more rapidly. The Galvanized Iron trade is booming. Mill agents are unable to fill all the orders coming in. The demand is general in its character. Mill prices are up 5 %, and store prices have stiffened to correspond.

Merchant Steel.—A fair trade is reported, but without special feature, save that railroad repair shops are now much heavier consumers of Tool Steel, and some large inquiries which have come up are due to that fact.

Track Supplies.—Steel Rails are no more active then they have been. Small orders are fairly numerous, but large lots are being held back for various reasons. Prices are unchanged at $31.50 @ $33. Splice Bars are in some demand at about 1.87½¢; Track Bolts and Spikes are quiet and unchanged.

Old Rails and Wheels.—Limited quantities of Iron Rails have been sold for delivery to Ohio mills, but no transactions have occurred to fix values here, which are nominally $22 @ $22.50. Steel Rails are still dull, but unchanged at $14 @ $16. Car Wheels are in fair demand at about $16.

Scrap.—There seems to be no market whatever for Wrought Scrap. Even the dealers are not disposed to speculate by making offers under what they consider the material worth. Cast is in some demand, but nothing else. Quotations are unchanged, as nothing has occurred to establish a new range of values. Dealers quote selling prices ₱ net ton: No. 1 Railroad Forge, $19; No. 1 Forge, $18; No. 1 Mill, $13.50; Fish Plates, $21.50; Car Axles, $23.50; Horse Shoes, $18.50; Light Iron, $8.50; Machinery Cast, $12 @ $12.25; Stove Plate, $8.50; Cast Borings, $7 @ $7.25; Wrought Turnings, $9.50 @ $10; Axle Turnings, $12.50; Mixed Steel, $10.50; Coil Steel, $14; Leaf Steel, $15; Tires, $15.50; Malleable Cast Scrap, $9.50.

Metals.—Casting Copper is weaker, but the decline is attributed to the news of the starting up of the Anaconda Mine, although it will be some time before its product comes on the market. Carload lots can be had at 11½¢. Lake is still held at 12¼¢. Spelter continues to be quoted at 4.85¢. Everett & Post state with regard to Pig Lead that the past week has been made eventful by the decline in values of Lead at all centers. Just what has caused the fall in values is a question the best informed are unable to answer, for at no point is there an accumulation of stocks, except New York, and that is virtually out of the market. There has been a very good inquiry, but little business has resulted, as consumers are timid and producers will not accept current prices. At Chicago there has been very little of interest to note. Values have ruled at 4.20¢ @ 4.10¢, with sales of some 600 tons, this and next month's delivery. At the close 4¢ is freely bid, but no sellers are to be found.

Cramer & Burt, Phœnix Building, have been appointed agents for the sale of the Charcoal Pig Iron manufactured by the Lone Star Iron Company at Jefferson, Texas. A circular has been issued by the company giving numerous testimonials to the quality of their Pig Iron for car wheels, machine work, hollow ware, &c. The following analyses are published:

Nos	1	2	3	4	5
Graphitic carbon	3.86	3.64	3.49	3.04	2.594
Combined carbon	0.76	0.44	0.76	1.09	1.421
Silicon	3.197	2.148	1.881	1.091	0 602
Sulphur	0.008	0.002	0.001	0.024	0.049
Phosphorus	0.058	0.168	0.117	0.161	0.151
Manganese	0.208	0.345	0.215	0.342	0.117

The phosphorus in No. 4 is stated to be the highest shown by any analysis.

The Harrington & King Perforating Company of Chicago have issued a notice to their trade that their sales office at 284 Pearl street, New York City, has been put in charge of Charles W. Mooney, succeeding J. H. Drake, who is no longer in their employ in any capacity. The company state that the office will be open for business every day, and prompt attention given to the wants of their customers. The company also call attention to the fact that they have purchased the Perforated Metal business of Bernard Dreyfuss of 258 and 260 Canal street, New York.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 27, 1891.

The market has not improved any since date of our last report, and if it were not for abounding confidence in the future, the feeling would be one of extreme depression. As it is, the dullness is regarded as merely temporary, and while it is disappointing, it is not disheartening. Ultimately there must be a very heavy increase in the demand, but for the present the supply is too heavy, so that buyers are frightened and prices drooping. How long it will be before the reaction comes is a question which time alone can answer, but the immediate indications are not favorable, so that producers are willing to accept extremely low figures for this year's deliveries, later dates being held more in accordance with what legitimate conditions appear to warrant. Trading under these circumstances has been somewhat limited, but there is no reason to apprehend any falling off in consumption, but the reverse.

Pig Iron.—The demand has been somewhat checked by the extreme anxiety to secure orders for immediate delivery. Consumption is probably larger to-day than at any time during the whole year, and although there was until recently a disposition to place orders for next year's delivery, the feeling is now quite the reverse, notwithstanding the fact that the conditions are even more favorable than they were at the time mentioned. Production is larger, but that was expected, yet there is a complete change of feeling, although even that should not cause much surprise. The immediate influences are probably, 1, a premature increase in production; 2, continued scarcity of orders at the large steel works, and, 3, a development of financial weakness in unexpected quarters. As regard the second, there is good reason for believing that that element will soon become one of strength instead of weakness, and as to the third, no serious apprehensions are felt, although in the meanwhile it may have induced sales at low prices, so as to realize cash and be in position to liquidate if need be as rapidly as possible. The chances appear to be, therefore, that while no immediate improvement is looked for it is hardly likely that the downward tendency will extend beyond its present limits, and

that a sudden and a sharp reaction is not by any means an improbability. Ordinarily it would be useless to expect any reaction until production was decreased, but these are not ordinary times, so that the improvement must come from an increased consumption, the only question being how long before we begin to realize it. If any one can answer that question they can solve one of the most difficult problems the trade have had to deal with. Presumably the reaction will start with the demand for Steel Rails, and that surely cannot be postponed very much longer. Meanwhile sales are being made in a small way at about the range of prices quoted below, prices varying according to brand, point of delivery, &c.:

Ohio Softeners, No. 1x	$19.00	@	.....
Ohio Softeners, No. 2x	18.00	@	.....
Standard Penna, No. 1x	17.75	@	$18.00
Standard Penna, No. 2x	16.25	@	16.50
Medium Penna, No. 1x	17.25	@	17.50
Medium Penna, No. 2x	16.00	@	16.25
Virginia, No. 1x	17.00	@	17.25
Virginia, No. 2x	15.75	@	16.00
Standard Neutral All-Ore Forge	14.25	@	14.75
Ordinary Forge Cinder mixed	13.50	@	14.00
Hot-Blast Charcoal	20.00	@	22.00
Cold-Blast Charcoal	24.00	@	27.00

Muck Bars.—Business continues to be very dull, and only small lots of the general run of Bars can be sold at about $26.50, delivered. One sale of extra quality is reported at $27, however, and makers of first-class Bars refuse to accept less than that figure.

Steel Slabs and Billets.—There is no change whatever, and last week's remarks would be equally applicable to-day. The feeling is feverish and unsettled, as orders for early delivery are anxiously sought for. Some of the mills are running close to the end of their order books, and to avoid shutting down would accept very low figures for immediate specifications. For delivery during the first quarter of the coming year $27 @ $27.25 is asked for the equivalent of seaboard deliveries, and about 50¢ less for points on the Susquehanna.

Steel Rails.—There is no special improvement as yet, but the number and character of inquiries seem to indicate heavy purchases within the next 30 or 60 days. For the balance of the year the mills have their capacity pretty well engaged, and after that there will be no scarcity of business. Meanwhile $30, at mills, remains as a firm quotation.

Bar Iron.—The demand is of the same general character as for several weeks past, and at about the same prices. The absence of large orders is a peculiar feature, and necessitates manufacturers to keep a sharp lookout for business, to prevent further curtailment of their output. The aggregate demand is quite large, but it comes chiefly in "dribs," so that even the best-managed concerns have nothing definite for more than three or four weeks at a time, and some not as much as that. Prices are as steady as can be expected under the circumstances, say 1.70¢ @ 1.75¢ for Best Refined at city mills, and 1.60¢ @ 1.65¢ at interior points.

Skelp Iron.—Demand very light, with a few sales of Grooved at 1.72½¢, delivered, and Sheared at 1.85¢ @ 1.90¢.

Plates.—There is quite a fair amount of business from one source or another, but manufacturers bid for it as though it was to be their last chance for the entire year. Sales during the past few days have been made at prices very much below anything ever recorded, although it is understood that requirements as to quality are to be very stringent. The order was for 600 to 800 tons of Steel, chiefly for locomotive boiler work, and while the exact prices are not given they are said to be a full $5 ₱ ton below the usual quoted rates. Something has been done in Ship Plates, too, several hundred tons having been taken for delivery in Buffalo. Last week's quotations are repeated as follows, but on large and desirable orders concessions are readily obtained:

	Iron.	Steel.
Tank Plates	1.90 @ 2.00¢	2.00 @ 2.10¢
Refined	2.20 @ 2.30¢	2.10 @ 2.20¢
Shell	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange	3.20 @ 3.30¢	2.50 @ 2.75¢
Fire-Box	4.00 @ 4.25¢	3.00 @ 3.50¢

Structural Material.—In this department things are a little mixed, some mills being busy, others quite the reverse. Prospects are fairly encouraging, nevertheless, and while the present irregularity may continue a while longer, there is no reason to expect any serious depression. Prices are unchanged, and for lots delivered are quoted about as follows: Angles, 1.95¢ @ 2.05¢; Sheared Plates, 1.90¢ @ 2¢, and in some cases about $\frac{1}{10}$¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is a pretty fair demand for small lots and as a rule mills are selling quite as much as they are turning out. Prices are fairly steady, as makers of first-class qualities are determined not to compete with inferior stuff, which is frequently forced on the market regardless of cost. For the best makes prices are about as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.10¢ @ 3.15¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.30¢
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¢ @ 3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—Demand slow and prices irregular, depending on quality and the degree of urgency to buy or sell. Anything that a buyer actually needs commands pretty full prices, while anything that must be realized on goes at comparatively low prices. General quotations about as follows: Iron Rails, $21.50 @ $22.50; Steel Rails, $17 @ $18, delivered; No. 1 Railroad Scrap, $20.50 @ $21, Philadelphia, or for deliveries at mills in the interior $21 @ $21.50, according to distance and quality; $14.50 @ $15.50 for No. 2 Light; $14 @ $14.50 for best Machinery Scrap; $13.50 @ $14 for ordinary; $14.50 @ $15.50 for Wrought Turnings; $10 @ $10.50 for Cast Borings, and nominally $23 @ $25 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Wrought-Iron Pipe.—There is no special change to note in this department, prices still showing more or less weakness. Nominal discounts are as follows, but extra discounts are obtainable on desirable orders:

Butt-Welded Black	57½ %
Butt-Welded Galvanized	47½ %
Lap-Welded Black	67½ %
Lap-Welded Galvanized	55 %
Boiler Tubes, 2½ inch and under	52½ %
Boiler Tubes, 3 to 6 inch	60 %
Boiler Tubes, 7 inch and larger	55 %

The Bristol Iron and Steel Company of Bristol, Tenn., put in blast their new furnace on last Friday, and so far the work is very satisfactory. The capacity is estimated at 900 to 1000 tons per week, and the intention is to run on a high grade of Foundry Iron. Justice Cox, Jr., & Co. of this city have been appointed sales agents, to whom all inquires and orders should be addressed.

The latest advices from Philadelphia are that E. Y. Townsend, president of the Cambria Iron Company, is sinking fast, and is thought to be beyond the hope of recovery.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, October, 27, 1891.

Pig Iron.—There has been no improvement in the situation during the past week. Dullness continues and prices are weak, with Bessemer for immediate or near-by delivery lower. Furnacemen are very much discouraged. Pittsburgh, so far as the producer is concerned, is considered just now the most unsatisfactory market in the country, and why it is difficult to determine, as there is little or no competition from outside furnacemen, nearly all of whom can do better at home or elsewhere. There has been no change in the price of Mill or Foundry Irons during the past week, but Bessemer Iron has sold at a further decline. A well-known firm here had intended to buy a lot of 3000 to 5000 tons, but they had so much offered and the price being considerably lower than they expected that they did not buy at all—were, to use a common phrase, "scared off." We quote as follows:

Neutral Gray Forge	$13.60	@ $13.85,	cash.
White and Mottled	13.00	@ 13.50,	"
All-Ore Mill	14.00	@ 14.50,	"
No. 1 Foundry	16.00	@ 16.25,	"
No. 2 Foundry	15.00	@ 15.25,	"
No. 3 Foundry	14.50	@ 14.75,	"
No. 1 Charcoal Foundry	21.50	@ 22.00,	"
No. 2 Charcoal Foundry	20.50	@ 21.00,	"
Cold-Blast Charcoal	25.00	@ 27.00,	"
Bessemer Iron	15.25	@ 15.50,	"

Sales of Mill Iron reported at $13.60, $13.75 and $13.85, cash, and we are cognizant of Bessemer Iron having been offered at $15.25, cash, for immediate delivery, and it is intimated that it might have been bought at $15, but there are very few sellers at these prices. So far as we can learn there are but few of the Valley furnacemen willing to sell under $15 at furnace, which is equal to $15.70 Pittsburgh, and it is doubtful if any of our city furnaces would sell for future delivery at less than $15.50 or $15.75. There is very little done in Foundry Irons.

Muck Bar.—There is no improvement in the demand; market weak and prices unchanged, ranging from $26.25 to $26.50, cash. There is nothing like the demand there was at this time last year, and the outlook for improvement is not very encouraging.

Manufactured Iron.—Some manufacturers report business as being quite active, having all they can do; others make a different statement and say that orders are not as numerous as they were a few weeks ago. On one point, however, they all agree, and that is in regard to prices being unsatisfactory. There is a very good demand for Bar Iron, and the Bar Mills are all busy; prices are still quoted at 1.60¢ @ 1.65¢ at valley mills and 1.70¢ @ 1.75¢ at city mills, 60 days, 2 % off for cash. Sheet Iron is still quoted upon a basis of 2.75¢ for No. 24; Plate and Tank Iron, 2.05¢ @ 2.10¢. There is not the demand for Skelp Iron usual at this season of the year, and prices to manufacturers are unsatisfactory; Grooved is being sold at 1.70¢ @ 1.72½¢ and Sheared at 1.87½¢ @ 1.92½¢, four months, 2 % off for cash.

Nails.—There has been some business in Wire Nails the past week, and while $1.80, 60 days, 2 % off for cash, f.o.b. at factory, is still the price generally quoted by manufacturers, it is intimated that desirable orders for immediate or near-by delivery might be placed at $1 75, which is very low. There is a general aversion on the part of manufacturers to contracting for future delivery. The Cut Nail trade is reported as being less active; prices still quoted as before, $1.60 for 30¢ average, 60 days, 2 % off for cash, in the Wheeling or Mahoning Valley district, no Cut Nails being made in Pittsburgh.

Structural Material.—There is possibly not so much new business, but mills

have all they can do working up old contracts, as contractors are pressing them on every side. The weather has been all that could be desired for building this fall, and builders are anxious to get their work as far on as possible. Prices firm, but unchanged. Beams and Channels, 3.10¢; Angles, 2¢; Tees, 2.60¢; Steel Sheared Bridge Plates, 2.15¢ @ 2.20¢; Universal Mill Plates, Iron, 2¢ @ 2.05¢; Refined Bars, 1.80¢ @ 1.85¢.

Steel Plates.—There is continued activity and prices are steady as quoted; some manufacturers are so well sold ahead that they are unable to take orders for immediate or even near-by delivery. We repeat former quotations: Fire Box, 3.85¢ @ 4.25¢; Tank, 2.05¢ @ 2.10¢; Shell, 2.75¢; Flange, 2.40¢ @ 2.50¢.

Merchant Steel.—There is a very fair degree of activity. Prices remain unchanged: Crucible Tool Steel, 6½¢ @ 9¢; do. Spring Steel, 4¢; do. Machinery, 4½¢ @ 5¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Tire Steel, 2.20¢; Toe Calk, 2.40¢ @ 2.50¢; Steel Bars, 1.80¢ @ 1.85¢.

Barb Wire—Is quoted at $2.95 for Galvanized and $2.40 for Painted, in car lots and upward, in the Pittsburgh and Cleveland district, f.o.b. at factory. Trade is reported as being only fair, but all possibly that can be expected just now.

Wrought-Iron Pipe.—There is a fair business, but it is not what it should be; but very few if any of the Pipe mills are working up to their full capacity and while the regular syndicate prices are still quoted, there are not in all cases being adhered to. The next monthly meeting takes place on November 4.

Old Rails.—There is a continued fair demand, but no change in prices. Sales of Iron at $23.50 @ $24; Steel at $17 @ $17.50 for short and $18 @ $18.50 for long lengths. Notwithstanding there have been no Iron Rails made for a number of years, there are still a good many on the market, and the statement is made that there are yet 2,000,000 tons to be taken up.

Billets and Slabs.—There is a fair demand for Steel Billets and Slabs and prices are weak. Sales reported at $24.50 @ $25, cash, f.o.b. at makers' mill. The mills both here and at Wheeling are pretty well sold up, but business is still being solicited, and the fact that Bessemer Iron is lower enables manufacturers to cut prices.

Steel Rails.—There is a continued fair demand, but so far as we are advised no large orders have been placed here recently. The price continues firm at $30, f.o.b. at makers' mill.

Wire Rods.—A city manufacturer reports a sale of 2500 tons at $35.25, f.o.b. at mill; this is the largest and most important sale that has been reported here for some considerable time.

Ferromanganese.—The price of domestic 80 % has been reduced $1 @ $1.50 ℔ ton, and it is now quoted at $65 @ $65.50.

Railway Track Supplies.—There is a continued steady demand, but prices remain unchanged: Spikes, 2.10¢ @ 2.20¢, 30 days, f.o.b. at works; Splice Bars, 1.75¢ @ 1.85¢; Track Bolts, 2.70¢ with Square and 2.80¢ with Hexagon Nuts.

Old Material.—There is a fair demand for No. 1 Wrought Scrap, with sales at $19.50, net ton. Cast Scrap, $13.50, gross; Leaf Spring Steel, $20, gross. Sales Steel Bloom Ends, $18, gross and Rail Ends, $18.50.

Connellsville Coke.—There is a steady demand, but prices remain unchanged, as follows: Furnace Coke, $1.90; Foundry $2.30; Crushed, $2.65, all per net ton, f.o.b. at ovens.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, October 28, 1891.

Pig Iron.—The market has been without other feature than quietness during the week, even the current demand has been light, but the larger part used was received on contracts, so that there is no apparent decrease in consumption. There being no pressure to sell, prices are well sustained. Gray Forge is selling at $10 at furnace for this year and for delivery the first two months in next year. Higher prices are asked for March and June, and 25¢ @ 50¢ more has been obtained in some instances, 5000 tons being sold of Gray Forge and Mottled. Ohio Soft Iron has sold to the extent of 6000 tons, and it is understood that pretty full prices were obtained. There has been little inquiry for Charcoal Iron, but the offerings are now urgent, and all kinds are firm. While the volume of business is comparatively small, the market is apparently in a healthful condition, and yet buyers claim that they could make more favorable terms for the first half of next year than are here indicated. The producers of Pig Iron are looking for a further enlargement in the consumption of Iron by the railroads, and are disappointed that it does not come more promptly. We quote as follows:

Foundry.	
Southern Coke, No. 1	$15.25 @ $15.75
Southern Coke, No. 2	14.00 @ 14.50
Southern Coke, No. 3	13.25 @ 13.50
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	20.00 @ 21.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00
Forge.	
Gray Forge	12.75 @ 13.00
Mottled Neutral Coke	12.25 @ 12.50
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	19.25 @ 19.75
Hanging Rock, Cold Blast	25.00 @ 26.00
Lake Superior Car Wheel and Malleable	18.75 @ 19 25

W. H. D. Totten, Jr., sales agent of Carnegie, Phipps & Co., Limited, has removed to more commodious quarters in the Neave Building, northwest corner Fourth and Race streets.

Cleveland.

CLEVELAND, October 26, 1891.

Iron Ore.—New life has been infused into the market during the past week and there have been several sales of fairly large amounts. Transportation rates are now so low that buyers feel safe in completing the work of filling out their stocks. The receipts for the past week exceeded those of a week ago, but were still 50,000 tons below those for the corresponding week in 1890. At the same time the shipments to the furnaces were extraordinarily heavy. The determination of the Ore men to clear up the docks preliminary to next season's business is in no manner better illustrated than by the rush of Ore from the lower lake docks to the furnaces. There have been sales of Non-Bessemer ores during the past week at $3.75, f.o.b. cars lower lake ports, and also of Menominee and Gogebic Bessemer at $4.75, f.o.b. cars Cleveland and Ashtabula. The total sales of the output of 1891 to date are estimated at close upon 7,000,000 tons, although many believe 6,500,000 tons an outside figure. There is already considerable talk about prices for next year and it would not be surprising if some very substantial blocks of next year's output should be sold before Christmas. Indeed, inquiries regarding probable prices have already been made. It is unlikely, however, that any contracts will be closed for a month or more.

Pig Iron.—The market is still lacking in activity. There have been a few sales during the past week, but prices were a little uncertain. We hear of sales of Bessemer Iron at $15.75, but the amounts involved were small. There seems to have been no improvement at all over the situation as existing two or three weeks ago. Prices seem to have changed in no essential particular, although dealers maintain with admirable persistency that the long expected rise cannot be much longer delayed. It is evident that consumption is very large, but all efforts to infuse activity into the market have been fruitless. Furnacemen look for an improvement in the market immediately after election—an event, by the way, that is having its effect upon the present status of the market.

Old Rails.—The demand is again fairly good, and $23 is the average price paid for Old Americans. Sellers, however, name $23.50 @ $24 as the actual quotations.

Scrap.—We hear of sales of No. 1 Railroad Wrought at $19.25 @ $19.50. Cast Scrap is quoted at $13.25 @ $13.50.

Manufactured Iron.—There is a good demand for Common Bar Iron at 1.65¢ @ 1.70¢. The mills are well engaged until January, 1892, and are not soliciting business.

Nails.—The market is fairly active, but prices are unchanged. Steel Wire Nails are bringing $2 in stock and Cut Nails $1.70. The former are in good favor with buyers and the demand is good.

Louisville.

LOUISVILLE, KY., October 26, 1891.

Pig Iron.—The market remains quiet, with few sales, and those mainly for delivery next year. Some furnaces are now willing to sell for delivery running to July at basis of $10.25 for Gray Forge, at furnace, and some purchases have been made upon this basis. Of No. 2 Foundry sales at $11.50, for delivery during the first six months of next year, have been effected, and it needs but some encouragement for heavy purchases to be made at about this basis. It however is not felt that prices this year will advance materially, and there are more furnaces willing to sell freely into next year at figures now ruling. There is a wide difference in the value of some grades, especially noticeable in No. 1 Foundry—one furnace holding at $12.75, others selling freely at $12, on cars, at furnace. We quote for cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry	$14.50 @ $15.00
Southern Coke, No. 2 Foundry	13.75 @ 14.25
Southern Coke, No. 3 Foundry	13.25 @ 13.75
Southern Coke, Gray Forge	12.50 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel, standard brands	18.00 @ 20.00

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date October 26, 1891, say: Almost every trade report heard here indicates an improvement, nor can the Pig Iron business be considered an exception, for there certainly are better transactions being made regarding both quantity and delivery than existed the first part of the month—that is, the extended deliveries which were granted then would have to be paid for now. While prices as a rule are the same, the inclination to advance and hold firm on the sellers' part is more general, and far fewer weak spots are discernable. Even the long suffering Iron seller is realizing that it is hardly possible with the improved condition of affairs generally that he will not receive some

benefit soon, though it comes more slowly than was generally expected. Not a few lots of Lake Superior Charcoal have changed hands, but these have not been large, except one of 3000 tons, for delivery November to March, going at full rates. Both Southern and Northern Foundry and Forge Irons have been quiet with the smaller trade, though the larger buyers have covered at private figures some contracts recently made. We report the market as follows:

Lake Superior Charcoal, all numbers	$18.00 @ $18.50
Lake Superior Coke, Bessemer	17.75 @ 18.50
Lake Superior Coke Foundry, all ore	17.50 @ 18.00
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Southern No. 1	16.25 @ 16.50
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery	18.25 @ 18.75

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, October 26, 1891.

Pig Iron.—The market fails to change in any particular. There seems to be a feeling prevalent, which is slowly gaining in strength, that prices have seen the lowest notch, and that there is not much chance of any lower figures being offered than are at present ruling. Inquiries are at hand for deliveries extending into next year, but furnacemen are chary about accepting contracts which will bind them much beyond the opening months of the coming year. There is some scarcity of Gray Forge, although not of sufficient magnitude to influence prices, and $13.25, f.o.b. cars here, is freely quoted. Consumption continues to keep up to the average, and consumers of Pig Iron are one and all very busy. The closing months of the year are usually dull ones, and judging from present indications the next two months will not prove exceptions to this rule. Sellers are anticipating a steady market from now until the new year opens, after which they look for a large trade and a corresponding advance in prices. At the moment the market seems firmly fixed, and with any kind of a fair demand the present range of prices will no doubt be well maintained. We quote as follows for cash, f.o.b. St. Louis.

Southern Coke, No. 1 Foundry	$15.50 @ $15.75
Southern Coke, No. 2 Foundry	14.50 @ 14.75
Southern Coke, No. 3 Foundry	13.75 @ 14.00
Gray Forge	13.25 @ 13.50
Southern Charcoal, No. 1 Foundry	17.25 @ 17.75
Southern Charcoal, No. 2 Foundry	16.75 @ 17.25
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	15.00 @ 15.50
Ohio Softeners	17.75 @ 18.75

Bar Iron.—A fairly active trade is the report of all the mills in this locality. Outside of a few orders placed by agricultural implement manufacturers, the mills have sold but a short time beyond January 1, and unless there is a decided change in the outlook they will enter the new year with comparatively few orders on their books, preferring to take the chances after the new year, when they confidently anticipate a higher market. Prices to-day are as follows: Lots from mill on cars at East St. Louis, 1.75¢; small lots from store, 1.85¢ @ 1.90¢, according to quantity.

Barb Wire.—There is not much that can be said regarding this commodity. Sales have been limited at prices recently adopted, which are: Painted, 2.70¢; Galvanized, 3.20¢; terms, 60 days, or 3 % discount for cash in ten days.

Wire Nails.—The Nail market continue without change. Inquiries are few, and while manufacturers are endeavoring to hold up prices, it is evident that they will be compelled to sell at those ruling to-day, or stock up their product in the warehouse. The latter they are not likely to do, and Wire Nails will no doubt continue to be sold at prices that the buyer himself will be forced to admit do not net the maker any profit Carload lots from mill are quoted at $1.95 @ $2. Jobbers quote $2.15 from store.

(By Telegraph.)

Metals.—The Pig Lead market is practically demoralized and an open quotation for November delivery is 4¢. A sale of 100 tons closed to-day for November delivery at 4¢. There is very little doing, however, as smelters refuse to consider any offer less that 4.10¢. To-day the market can be quoted steady, but dull, at 4¢. Spelter continues to be a weak sister to Lead and 4.65¢ for November delivery is freely quoted; in fact, orders would be accepted for delivery extending over the next six months at this figure. Offerings are very free for the next three months' delivery, and sales are reported at 4.65¢. Furnaces are all running full time and the output of Spelter continues to be unusually heavy. The market is fairly steady at 4.65¢, but consumers will probably be able to do better than this before many days.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, October 28, 1891.

American Pig.—The market remains dull, without any features of interest. There has been some buying of special Bessemer Pig at $16.50, delivered, and there is inquiry for additional quantities. We quote Northern brands, $16.75 @ $18 for No. 1; $16 @ $16.50 for No. 2, and $14 @ $14.50 for Gray Forge. Southern Iron sells at $16.25 @ $17 for No. 1; $15.50 @ $16 for No. 2; $14.50 @ $14.75 for No. 3 Foundry, and $14.25 @ $14.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—There has been no business of any consequence in the Spiegel market. For the present the leading Eastern buyers seem to have supplied themselves, the demand being covered in at least one case as far as July next. In Ferromanganese there has been only a jobbing business in this market, which is somewhat disturbed by the reports of sales in the West. Notable among these is one lot of 250 tons sold at $64.70, delivered at Mingo Junction, which is equivalent to $62.30, Baltimore. We quote 10 to 12 %, $23 @ $24; 20 %, $27 @ $28, and 80 % Ferro, $63 @ $63.50.

Billets and Rods.—The market in this section is dull, and efforts to hunt up some business for foreign Billets have not brought about any results. In Rods there have been some sales of No. 8, but otherwise the market is very quiet.. We quote: Domestic Billets, $27 @ $27.50, delivered; foreign Billets, nominally, $31 @ $31.50, and domestic Rods $37.25 @ $37.75, tidewater. From the West come reports that Billets are being offered at a very low price for immediate delivery.

Steel Rails.—There has been further buying, and we can record sales aggregating about 25,000 tons, which include one block of 20,000 tons done by an Eastern mill, which is now in comfortable shape up to March, running single turn. Another Eastern works is known to have booked quite well, while the third is still eagerly seeking business. There are further orders pending, which will be closed at an early date, while some roads are not yet in the market, simply because they have not looked into their requirements for next year. On the whole, the outlook for winter work is quite good, while spring and early summer work is expected to come up a little later in abundance. In the West, Chicago is reported to have secured 32,000 tons for the Great Northern, besides other orders, which put it into fair shape. While the outlook is, therefore, not all *couleur de rose*, it is evidently quite fair, with the prospects of a heavy demand from quarters which have not as yet approached the market. We quote $30 for standard sections. There has been cutting lately on light sections, with offers about $1 below the price-lists.

Manufactured Iron and Steel.—Local mills and merchants report that new business is scarce, and that the market has relapsed into dullness. Some of the mills have enough bridge work in hand to keep them comfortably busy for months, but new architectural work is light. We continue to quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.90¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 1.95¢ @ 2.15¢ for Tank; 2.20¢ @ 2.30¢ for Shell; 2.45¢ @ 2.65¢ for Flange; 2.65¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2.15¢ @ 2.20¢, delivered. Steel Axles, 2.15¢ @ 2.25¢, and Links and Pins, 2.15¢ @ 2.20¢.

Track Material.—There is considerable business offering for spring delivery, but prices are sharply cut for Fish Plates, to secure desirable orders. We quote 2.15¢ @ 2.25¢ for Spikes, 1.70¢ @ 1.90¢ for Fish Plates, and 2.80¢ @ 3¢ for Bolts, delivered.

Merchant Steel.—Business is on a moderate scale in this market. We quote Hot-Rolled Shafting 2¢ @ 2.10¢; Machinery, 2.10¢ @ 2.25¢; Tire, 2.15¢ @ 2.25¢, and Toe Calk, 2.20¢ @ 2.30¢, delivered.

Old Material.—The market is very dull, with Old Iron Rails nominally $20 @ $21, while Old Steel Rails are offered at $16.50 @ $17, Jersey City, without finding takers.

Financial.

The financial outlook, from the bankers' and mercantile standpoint, improves from week to week. The predictions of optimists have been more than verified, up to this date. Bankers are gratified in observing the free return of gold from Europe, which was believed to have been necessary to avert a crisis of some severity. It comes in season to meet a demand of at least $3,000,000 a week from the interior to move the crops. The calculation is made in a general way that a favorable balance in the foreign trade, equal to something like $200,000,000, must be liquidated by sending either gold or its equivalent in merchandise or securities. Exports of grain alone will call for $150,000,000, and as a great deal of imported merchandise remains unsold, on account of overstocking previous to the new tariff, it is reasoned that imports for some time to come will be on a reduced scale. Cotton, too, will continue to go abroad in large quantities, both raw and manufactured, but at a valuation which, for the present, cannot be determined. Altogether, the prospect is good for a return of gold equal to or even in excess of the temporary loss. Americans, therefore, reasonably look for easy money.

To conservative minds the chief danger is in the direction of undue inflation and speculative tendencies. Breadstuffs, after a salutary reaction, are inclined to advance again, private cables bringing good buying orders for future wheat, corn and oats; while spot business is checked by the

scarcity and high rates of ocean freights and by the absence of much room disengaged this side of January for any of the European ports, and especially to the United Kingdom. The underlying strength is the situation in Europe. A remarkable feature is the avidity with which Western millers are taking grain for conversion into flour. Later in the year the outward movement of corn will give ocean tonnage full employment. The statement just rendered by the Bureau of Statistics shows that the exports of merchandise from the United States during September were $82,587,897, the largest for six years, while the imports amounted to $61,500,000, a decrease of $14,000,000 as compared with September, 1890. The excess of exports of merchandise for the month was $21,083,901, while in 1890 the imports exceeded the exports by $7,246,605. For the three months ended September 30 the figures make a still more striking comparison, showing an excess of exports of merchandise of $23,439,080, against an excess in imports for the same three months of last year of $35,372,172. For the 12 months ended September 30 the excess of merchandise exports is close on $100,000,000.

The most important feature in the stock market was the large business in railroad mortgages. There was a good demand for all the Vanderbilt stocks. Sugar Refiners' fell off on news of a reduction in the price of refined sugar to 4¢ ℔ lb. After the middle of the week, under the lead of St. Paul, there appeared to be good buying of Atchison, Topeka and Sante Fé for European account. There was an improvement in Reading and in other coal shares, and an advance in Richmond Terminal on Saturday on a report that the financial condition of the company was better. The good earnings of St. Paul and other roads in the grain region were taken as indications of the heavy business yet to come. On Monday changes in prices were only fractional. The drop occasioned by the assignment of Irving A. Evans & Co. of Boston was but temporary.

United States bonds closed as follows:

U. S. 4½s, 1891, extended	100
U. S. 4s, 1907, registered	116⅞
U. S. 4s, 1907, coupon	116⅞
U. S. currency 6s	111

Money had an easier tendency; time loans were secured without difficulty on good collateral, but lenders were not eager to make them for three months because such loans will mature in January. Rates were 4 to 4½ % for 30 to 60 days and 5 to 5½ for four to six months. There was a better business in commercial paper and more inquiry from city banks and other local institutions. The bank statement showed a gain of $4,176,700 in cash and of $3,361,450 in surplus reserve, which now stands at $12,391,150. Loans increased $248,000. The stock of specie has steadily increased since the beginning of June. In Chicago the comparatively small demand for money is attributed to slack business.

Sterling exchange was weaker on account of the pressure of commercial bills, mostly cotton. The rate was reduced very near to the gold importing point.

Silver was lower, making the present value of the Bland dollar a fraction less than 75¢.

Exports of merchandise from New York for the week, $8,393,000; imports, $9,362,000. Exports included 1,476,000 bushels of wheat, 105,700 barrels of flour, 530,000 bushels of corn, 31,000 bales of cotton.

A convention is to be held at Rochester, November 12, for the purpose of organizing the New York State Board of Trade. Every local Board of Trade in the State or other body organized for general commercial purposes is expected to appoint two delegates.

Coal Market.

The Anthracite Coal trade, viewed from the operators' standpoint, has a more cheerful tone than before for many months. The reduced supplies in stock, together with the active consumption by manufacturers and a lower temperature, have put the market in a more healthful state. As was to have been expected, prices are stronger week by week, but anything higher than September quotations would be misleading. No Coal whatever has been sold at the latest advance and perhaps there is little hope of realizing the highest figures named, but the effort operates to stimulate buyers. Lehigh Coal is becoming scarce and some of the big operators claim to be practically out of the market. Lehigh Stove is $4.25, net, f.o.b., Broken and Egg are firm at September prices, Chestnut is $3.90, net, the same quality that has been selling at $3, f.o.b. So there is no difficulty in seeing that a decided change has come over the market. Still trade is dull. Orders at May prices are nearly closed out. There are some at June and still more at July.

September prices are as follows; f.o.b:

	Grate.	Egg.	Stove.	Nut.
Lehigh	$3.90	$4.15	$4.25	$3.90
Free	3.65	4.00	4.15	3.90

The Bituminous trade is good at association prices, which are firm.

The total amount of Anthracite Coal sent to market for the week ending October 17 was 984,759 tons, compared with 897,797 tons in the corresponding week last year, an increase of 86,962 tons. The total amount of Anthracite mined thus far in the year 1891 was 30,613,313 tons, compared with 27,682,342 tons for the same period last year, an increase of 2,930,971 tons. The Pennsylvania Railroad reports for the week 290,000 tons, Reading 310,000 tons.

Vessel freights are higher, 45¢ @ 60¢ from New York to Boston, and 60¢ @ 70¢ from Port Richmond to Boston.

A new Coal company has been organized at Clarksburg, Va., to open the Roaring Creek Coal fields, through which runs the largest vein of Coal in West Virginia. Henry G. Davis, son of ex-Senator Davis, has been appointed superintendent. This is the field from which the largest single lump of Coal ever known to be mined up to 1876 was taken. It was exhibited at the Centennial in Philadelphia, and was taken from a vein ranging from 400 to 600 feet in thickness.

Philadelphia complains of an arbitary advance of 50¢ ℔ ton to $4.30 for Coal which cost at the mine $1.60 ℔ ton. At present it is said that no Coal can be had at the mines for less than $2.60, whereas the September circular for Stove was $2.40.

John K. Ackerman died in Newburgh on Thursday night at the age of 74. He had been overseer at the Pennsylvania Coal Company's works for about 25 years, and had been in the employ of the company 40 years.

"Observer" in the *Coal Trade Journal* criticizes severely the management of the Anthracite trade. Referring to the farcical advances made on paper and restrictions which failed to restrict, the writer says: "Let us see how September results figure out:

	Grate.	Egg.	Stove.	Nut.
Prices at tide.	$3.40	$3.60	$3.80	$3.60
Deduct f'gt & com.	1.95	1.95	1.95	1.95
Net pr'ce at b'k'r.	$1.45	$1.65	$1.85	$1.65

"What mining company or individual operator can pay the going rates for royalty and make a dollar at these prices? Of course they cannot except in the cases of the great companies who make the freight charges cover their profit.

"Now comes the important question. No better year for the Anthracite trade than the present need be expected. When a market which will take 40,000,000 tons is so handled that no better prices than those of the present year can be obtained for Hard Coal, then the prospect is serious. Production has been kept 500,000 tons ahead of demand, to the detriment of profits, and so it will continue as for three years past as long as transportation charges cover two profits, one for mining and one for carriage. If but a reasonable charge were made for transportation, the great companies would be anxious for such a price at the pit's mouth as would clear a mining profit; now, with a mining profit in the freights they need not care about it." The writer concludes with a plea that outside operators combine against alleged extortionate freights.

Metal Market.

Copper.—Immediately following our last review there was pressure of Lake Superior Ingot for sale from various quarters that led to several hundred thousand pounds being sold at 11½¢ and a few parcels at even lower prices. There were also a number of speculative "short" sales at nearly the bottom figures. This was the result chiefly of continued pressure from the disturbing influences that have been more or less conspicuous in the home and foreign markets for several weeks and which are still carefully watched in all quarters. Some reaction from the extreme lowest prices has taken place in London, and the pressure to make sales on this side of the Atlantic has moderated also. It is obvious, however, that present prices do not prompt consumers to buy heavily. Instead of doing that, they merely provide for imperative wants, as though committed to the belief that there is more to gain than to lose by conservative action, in view of the enormous production and indications of increase in the same later on. At the close Lake Ingot was offered at 11½¢ from first hands. Casting brands sell at 11½¢, the spot supply of the same being momentarily light.

Pig Tin.—The price of Straits Tin has been below the 20¢ mark, but it remained there for a short time only, the "bull" interest not only having protected themselves against the effort to place the market where "puts" might be turned to advantage by the opposition, but turned the tide, and have since kept the market fairly firm in the face of lower prices cabled from London. When affairs were in shape indicative of a "spill" speculative trading became somewhat animated, but the subsequent turn discouraged the "bear" interest, and they have engaged in little else than mental speculation for several days. Meanwhile the out-of-town trade has been assiduously looked after by the chief holders of Tin, and, although jobbers and consumers confined their purchases as closely to imperative wants as safety would permit, quite a good block of surplus stock has been worked off. Spot prices at the close were 20¢, net cash, for 10-ton lots, and 20.10¢ @ 20.20¢, regular, for smaller quantities. It is understood that there are "puts" out at 20.10¢ to the extent of about 250 tons falling due next month. If recent trade history repeats itself those privileges will hold the market for a time.

Pig Lead.—In this branch of the market matters have gone from bad to worse. For several days sellers held out with a certain degree of patience for buyers to take hold at 4½¢. Their patience was rewarded by the sale of moderate quantities only, chiefly single carloads. Then the price was dropped to 4.20¢ and a few hundred tons were disposed of, but the response from buyers proved to be very disappointing and the market at this writ-

ing is weak, with 4.20¢ the extreme high price for wholesale quantities.

Spelter. — Prime Western brands have been sold at 4.95¢, and are still offered at that price, while some that do not enjoy an enviable reputation may be secured at 4.90¢. The demand is without visible improvement. Orders for more than single carloads are, in fact, very few and far between.

Antimony.—The market remains very firm, but is rather quiet. Cookson's is scarce on the spot, but there is a fair quantity in transit. Hallett's is quoted at 11½¢, LX at 12¢, L. J. & C. at 12¢ and Cookson's at 15¢, in wholesale quantities.

Tin Plate. — The situation remains practically the same as outlined last week. Buyers are not taking with greater freedom, nor do they manifest much concern regarding the future. At intervals a cheap parcel of Cokes is picked up, but supplies of other Plates seem to be fairly well under control, and prices hold quite steady nearly all along the line. Roofing sizes, being scarce, are particularly firm. We quote: Coke Tins—Penlan grade, IC, 14 x 20, $5.30; J. B. grade, do., $5.45; Bessemer do., $5.35; Siemens Steel, $5.50. Stamping Plates — Bessemer Steel, Coke finish, IC basis, $5.75; Siemens Steel, IC basis, $5.85 @ $6; IX basis, $6.85 @ $7. IC Charcoals—Melyn grade, $6.50; for each additional X add $1.50; Allaway grade, $5.85; Grange grade, $5.90 @ $5.95; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.75; do., 20 x 28, scarce; M. F., 14 x 20, $7.50; do., 20 x 28, $15.25; Dean, 14 x 20, scarce; do., 20 x 28, $10.70; D. R. D. grade, 14 x 20, $5.25; do., 20 x 28, $10.12½; Mansel, 14 x 20, $5.50; do., 20 x 28, $10.45; Alyn, 14 x 20, $5.50; do., 20 x 28, $10.50; Dyffryn, 14 x 20, scarce; do., 20 x 28, $11.25. Wasters—S. T. P. grade, 14 x 20, $5; do., 20 x 28, $9.85; Abercarne grade, 14 x 20, $4.90; do., 20 x 28, $9.70.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 22.

20 tons Tin, January.....20.05¢
35 tons Tin, November.....20.00¢
10 tons Tin, December.....20.00¢
25 tons Tin, October.....20.05¢

FRIDAY, October 23.

10 tons Tin, December.....19.95¢
25,000 lb Lake Copper, del. October 28...11.50¢
50,000 lb Lake Copper, December.....12.50¢

MONDAY, October 26.

35 tons Tin, December.....20.05¢

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 28, 1891.

Scotch warrants have remained almost stationary at 47/, with transactions small. Cleveland receded to 39/1½¢, with limited trading, and Hematites dropped to 48/7½, although rather more active. Speculation in the several lines is still spiritless, there being very little outside interest. Stocks in Connal's stores at last report were 499,000 tons Stotch and 149,000 tons' Cleveland. Latest sales of warrants were at 47/ for Scotch, 39/ for Cleveland and 49/ for Hematite.

Pig Tin for prompt delivery dropped to £90. 7/6 and has been almost neglected by outside speculators. Smallness of stocks falls flat as an incentive to purchases, owing to flatness of the market for other metals.

Copper has been unsettled and depressed, with many holders alarmed at the aggressive action of the "bear" party and reported reopening of the Anaconda Mines, with promised large production. Some good buying took place at the lowest prices and reduced offering has restored confidence in some degree. A great deal of Copper has passed into strong hands and it is suggested that the market has been smashed by powerful operators interested in Rio Tinto and other mining shares. The consumption is good and an increased demand for Sulphate is noted. The Société des Métaux sale has been postponed until December.

Tin Plate market has been quiet, but makers hold prices firmly. The Abercarne Works have been closed, owing to scarcity of orders at remunerative prices. New works started at Neath.

The Steel trade is in better shape. Rails in particular are firmer under the influence of improved demand. It is stated that the Darlington Steel Company have booked a large American order.

Scotch Pig Iron.—Prices for makers' brands remain almost stationary, and business is moderate.

No. 1 Coltness,	f.o.b.	Glasgow	57/6
No. 1 Summerlee,	"	"	57/
No. 1 Gartsherrie,	"	"	57/
No. 1 Langloan,	"	"	57/6
No. 1 Carnbroe,	"	"	48/6
No. 1 Shotts	"	at Leith	58/6
No. 1 Glengarnock,	"	Ardrossan	57/9
No. 1 Dalmellington,	"	"	51/
No. 1 Eglinton,	"	"	51/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—Dealings still on a moderate scale and prices rather weak at 39/6 for No. 3 Middlesborough, f.o.b.

Bessemer Pig. — Business improves very little, but makers' prices are held steady at 50/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen. — The market remains quiet, but prices are quite firm. English 20 % quoted at 95/, f.o.b. shipping port.

Steel Rails.—There has been a fair business, but demand now quieter. Heavy sections quoted £4. 2/6 and light sections £5 @ £5. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—Market remains quiet and unchanged. Makers quote £4. 2/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—There is no improvement in the demand or change in values. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Dealings are moderate and at old prices. Bessemer quoted at £4. 5/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Holders firm in their views, but the demand moderate. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—Prices steady and the demand fair. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Market quiet and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—There is still a good business and prices keep steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	8	10	0
" Common "	6	15	0	@	6	17	6
Staff. Bl'k Sheet, singles	7	10	0	@	7	12	6
Welsh Bars (f.o.b. Wales)	5	10	0	@	5	12	6

Pig Tin. — Market closes steady, but quiet. Straits quoted at £90. 7/6, spot, and £91 for three months' futures.

Copper.—The market still rather weak at the close. Merchant Bars quoted at £46. 7/6, spot, and £47, three months' futures. Best selected, £52.

Lead.—Dealings moderate and at unchanged prices. We quote at £13 for Soft Spanish.

Spelter.—Demand slow and the market rather weak at £23. 7/6 for ordinary Silesian.

Tin Plate.—Prices steady, but business moderate. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/9
IC Bessemer Steel, Coke finish	13/6 @ ....
IC Siemens " " "	13/9 @ ....
IC Coke, B. V. grade	13/3 @ ....
Charcoal Terne, Dean grade	12/9 @ ....

PERSONAL.

E. M. Dickey, president, and William Hopkins, superintendent, of the Iowa Iron Works, Dubuque, were the recipients of many congratulations on the occasion of the trial trip of the Government snag boat James B. McPherson, built by them.

Jacob Capp of the West End Rolling Mills, Lebanon, Pa., was seriously hurt recently by the rolling upon him of a heavy barrel.

S. S. Hartranft has accepted the position of furnace manager of Pickands, Mather & Co., at Cleveland, Ohio.

W. Porter, for years superintendent of the Colwell Iron Works, and for the past year general manager of the Chester Foundry and Machine Company, is now connected with the Wheeler Condenser and Engineering Company, at Carteret, N. J.

Among the candidates for membership in the American Society of Mechanical Engineers are E. J. Cook of the Field Engineering Company, New York; G. H. Cushing, superintendant of the Gould's Manufacturing Company, Seneca Falls, N. Y.; W. E. Dodds, superintendent of the Scott Foundry, Reading, Pa; E. L. Ford, Youngstown Steel Company, Youngstown, Ohio; James Hartness, Jones & Lamson Machine Company, Springfield, Conn.; H. F. Holloway, Akron Iron Company, New York; W. S. McKinney, McKinney Manafacturing Company, Allegheny; E. D. Meier, Heine Safety Boiler Company, St. Louis; Jos. C. Platt, New York; A. C. Rand, president Rand Drill Company, New York; Frank Richards, superintendent Ingersoll, Sargeant Drill Company, New York; John Richards, San Francisco, Cal; W. M. Wood, president American Projectile Company and Electric Pipe Bending Company, Boston.

Edwin Mickley is president of a company who propose to build a town at Bessemer City, N. C.

Wm. L. Abbott, chairman of Carnegie, Phipps & Company, Limited, of Pittsburgh, arrived in Pittsbugh on Friday after a two months, tour in Europe. During his absence Mr. Abbott was in consulation with Andrew Carnegie regarding the business interests of the Carnegie Associations. In regard to the report that important changes are contemplated in the Carnegie Associations, we can state that there is no truth in it whatever.

HARDWARE.

Condition of Trade.

THERE IS A LACK of entire agreement in the reports from different sources and sections as to the condition of business, some advices indicating that trade is moving on with good but not unusually heavy volume, while others refer to the demand as sluggish and the amount of business transacted as somewhat below the average. Some manufacturers, for instance, are behind their orders, and allude to the state of trade as exceedingly satisfactory, with, however, some complaint in regard to narrow margins, while others freely express their disappointment and refer to the season's business thus far as scarcely up to last year's. In some Hardware centers jobbers report an excellent business, while reports from other leading points are characterized by a different tone. The situation is probably, taken all in all, about as at our last report, without the increase in business which it was hoped the advance of the season would bring. In fact, there are some indications of an increased conservatism on the part of the trade in placing orders, and in some instances jobbers are making special efforts to dispose of staple goooods, and to this end are making concessions in price. There is still some complaint in regard to collections.

St. Louis.

(*By Telegraph.*)

Jobbers continue to keep well supplied with orders. The cooler weather at present prevailing throughout the West is influencing trade somewhat and especially from the North and Northwest the demand is very heavy. Prices do not change any, although in some specialties a tendency toward weakness is perceptible, notably in Wire and Cut Nails, Copper, Lead, &c. Heavy Hardware is in good demand. The outlook is encouraging and with continued cold weather a steady trade is anticipated.

Chicago.

(*By Telegraph.*)

The demand for Shelf Hardware is reported fair by all the houses here. Some of them have had a heavier run of orders the past week than previously, but the trade generally is not gaining much on the volume of business reported earlier in the month. Straight Hardware and seasonable goods still constitute the bulk of the business being handled, and large gains are not to be expected until staple goods are in better demand. The house-furnishing line shows an improvement, due to the slightly colder weather, which is but a foretaste of what they expect in a short time when the November winds begin to blow. Collections are growing worse again. Country merchants are asking more time because farmers are not paying up. Some are holding their grain for higher prices, others have posponed threshing until they finish other work, and meanwhile money is scarce in many agricultural districts. Prices are unchanged except in the case of staple goods, which some jobbers here are making efforts to move. Tin Plate is not quotably higher but is considerably firmer.

Notes on Prices.

Cut Nails.—Since last week there has been no important change in the tone of the Cut Nail market, prices continuing on substantially the same level as for several weeks. Some of the mills are reducing their production and on the part of others there is a disposition not to force sales at extreme prices. There are, however, others who are ready to sell at ruling rates, and the trade have no difficulty in procuring Nails at low figures. For Eastern Nails the general price remains $1.50, in round lots at mill, but this price is shaded in special cases. In the Wheeling district Nails are held firmly at $1.50 to $1.55, with 30-cent average, some makers, however, refusing to accept the former figure.

Chicago, by Telegraph.—Steel Cut Nails are again more active, and numerous orders are reported by manufacturers. A remarkable feature of the trade at present is the demand for Cut Nails from Iowa, a State in which Wire Nails had made very heavy inroads on Cut Nails. The movement is of sufficient proportions to have attracted the attention of several important sellers here, who believe it to be significant of a reaction among consumers. Wheeling Nails are selling on a basis of $1.50 at mill on 30-cent average, while local Nails are quoted at $1.65, same average. Jobbers still quote $1.75 to $1.80 from stock.

Wire Nails.—There is some unevenness in the quotations made by leading mills, some of whom refuse to meet the low prices ruling. The quotation for large lots at mill accordingly ranges from $1.75 to $1.85, the lower of these figures being given only in exceptional cases on large and desirable orders. Many Nails in carload lots are sold at about $1.80, at mill. From store small lots are quoted at $2 to $2.15, according to the market.

Chicago, by Telegraph.—Not much business appears to have been done the past week by manufacturers, who have evidently loaded up the jobbing trade with good stocks. The next move to be expected is from the jobbers who are desirous of getting the Nails off their hands and distributed through the retail trade. Jobbing prices generally range from $2 to $2.05 and efforts are being made by most houses to adhere closely to these rates.

Barb Wire.—The volume of business is moderate, and the market in Barb Wire is devoid of special features. The trade are purchasing with reasonable freedom, according to their present or prospective requirements for the near future. No change has been made in prices, which are referred to as regularly maintained.

Chicago, by Telegraph.—The Columbia Patent Company report a fair volume of business at unchanged prices. Efforts are being made by unknown parties to hinder the company's sales by the distribution to customers of circulars advising them not to purchase at present, as the price is going lower. The motive actuating these parties is not perceptible. Jobbers report but a limited demand from their customers and quote as before.

Common Carriage Bolts.—The manufacturers of Common Carriage Bolts have advanced their price about 5 per cent., making the present quotation discount 70 and 10 and 12½ per cent., with an additional 2 per cent. for cash. Rebates for quantities remain as before.

Double-Pointed Tacks.—These goods, which for some time have been somewhat irregular and weak, are now quoted at lower figures than heretofore.

Glass.—At the meeting held by American Glass manufacturers at Columbus, Ohio, October 20, existing prices were reaffirmed. There has been a feeling that the price of 80, 10 and 5 per cent. discount for car lots, which was made at a former meeting, was too low, and hopes were entertained that at the meeting held last week the price would be changed to 80 and 10 per cent. Such factories as are running in the Pittsburgh district report that they have all they can do to fill orders; and jobbers who are handling natural gas Glass exclusively are unable to keep their stocks assorted up to demand. It is reported that some Western jobbers loaded up so heavily at the low prices existing last spring that they are now selling Glass at a lower rate of discount than is offered by the manufacturers. The New Jersey factories are taking orders for Glass and filling them as fast as possible. A meeting of importers of foreign Glass is to be held this week, to decide upon the price of Glass for the month of November. It is understood that the present price will be reaffirmed, and that there is likely to be no change made in prices before the end of the year. Quotations remain unchanged, as follows: American Window Glass, in carloads, 80 and 10 and 5 per cent. discount; less than car lots, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and Imported Plate at a discount of 60 per cent.

Trade Items.

THE MUNGER-COLTON MFG. COMPANY, 142 Lake street, Chicago, have introduced a most excellent idea in packing their Parlor Door Hangers. They inclose with each set a sheet of full-sized working drawings for the instruction of the mechanic who hangs the door. Not a detail is omitted which has the slightest bearing on the work. They have even gone further than this. As screws of different sizes are needed for the several parts, they have separated them and put each size up in a special envelope, on the outside of which is printed the number of screws to be found within and the purpose for which they are intended. Since they have adopted this plan they have received commendatory letters from all quarters, showing that they have met a long-felt want. The scheme is such a good one that it commends itself to all manufacturers of mechanical devices with which there may be the slightest difficulty experienced by the average mechanic. Even the most expert and intelligent workmen must often be puzzled to make the proper application of the meager printed directions given them for the adjustment of complicated devices.

FRANK D. ALDRICH, secretary of the Samson Cordage Works of Boston, spent some time in Chicago last week. He reports business active in his line, with excellent prospects. Arrangements are being made through H. H. & C. L. Munger, their Chicago agents, for an exhibit of the products of the company at the World's Fair. A new demand for their special water-proofed cotton cordage has been found in the suspension of arc lights, for which a strong and durable cord is required. This demand is growing to considerable proportions.

THE ST. LOUIS WIRE MILL COMPANY, St. Louis, Mo., have recently completed and occupied a handsome suite of offices. They are tastily furnished and lighted by incandescent lights, the electricity being generated on the premises. The floors are of hard wood and the side walls are wainscoted with light pine to a hight of about 4 feet. The private office, occupied jointly by the president and treasurer, is furnished with a special view to comfort. The floor is carpeted and the furnishing throughout is of quiet elegance. A beautiful carved wooden mantel, with tiled hearth, adds additional charm to this office, while the general furnishing of the entire suite is above the average.

SLAYMAKER, BARRY & CO., Lancaster, Pa., are about issuing to the trade a circular in which they announce that they have severed connections with all of their agents for the wholesale trade except John H. Graham & Co., 113 Chambers street, New York, with whom they have entered into an arrangement whereby they become the sole agents for the sale of their goods to the wholesale trade of the United States. The agents will carry a stock of all grades of these Padlocks and Sash Pulleys at their New York warehouse, from which place all orders which it is advisable to ship from New York will be filled. The circular also calls attention to the manufacturers' system of vertical Tumblers, to the advantages of which they refer as holding the tumblers in place by the solid metal of the case, thus giving them especial durability, security, solidity and smooth, easy-working qualities. All of the Locks are spring self-locking and are labeled Vertical Tumbler Spring Self-Locking Scandinavian Padlocks.

OUR READERS will be reminded of the proximity of the skating season by the advertisement of Messrs. Merwin, Hulbert & Co., 26 West Twenty-third street, in which they call attention to their new Forbes Patent Skate. They suggest that a few pairs ordered now will sell many during the season.

THE LAMBERT & BISHOP WIRE FENCE COMPANY of Joliet, Ill., are greatly improving their plant. The capacity of every department is being doubled. The additions are now well under way and will be completed in a short time. The company have long been an important factor in the Plain Wire and Barb Wire trades and their influence will next be felt in the Wire Nail trade. Important advantages are secured by establishments manufacturing both Barb Wire and Wire Nails, as mixed orders now constitute the bulk of the business, and the Lambert & Bishop Wire Fence Company will be in excellent shape to meet this tendency of the trade. Their advertisement calling attention to their manufactures will be observed on another page.

OUR READERS will observe the advertisement of the Boston and Lockport Block Company, Lockport, N. Y., which represents the new Steel Tackle Block they have recently put on the market, to the lightness, strength and durability of which they refer, information in regard to which may be obtained from the factory or their agents, Messrs. H. B. Newball Company, 105 Chambers street, New York, or Messrs. H. C. Gurney & Co., Chicago.

THERE IS SOME COMPLAINT of the manner in which the letter of the import laws is followed, with a practical evasion. We are advised that goods are constantly being imported with the name of the country from which they come merely painted or pasted on in such a manner that it is easily removed, sometimes hardly surviving the journey, and barely getting through the Custom House. This, we understand, has been the case with some Anvils and other heavy goods, which thus soon lose the indication of the country of their origin, and are in some cases mistaken for domestic goods.

IN THEIR ADVERTISEMENT on another page John H. Graham & Co., 113 Chambers street, New York, call attention to the XXX U. S. Club Skates, manufactured by P. Lowentraut, Newark, N. J., and also to their Columbia, Eureka, U. S. and U. S. Ladies' Club.

AN INTERESTING PAMPHLET is being sent out by the American Screw Company of Providence, R. I., in which views are given of their Eagle, New England and Bay State mills, located at Providence; also of their Canada Screw Company plant, Hamilton, Ontario, and their British Screw Company works, Leeds, England. Representations are also given of the various medals received by them, dating from 1841 to 1890. Illustrations are given showing the progress made in the manufacture of Wood Screws from the blunt point Screw to that of the present time; also a series of cuts showing how the Wood Screw thread is developed by the Rogers cold forging process, the patents being owned by this company. The result of this development is shown in their spur-pointed Wood Screw. Illustrations are also given of Rogers' Drive Screw, fluted Tire Bolt, and cold-forged Coach Screw. The latter has a centralized point, taper shank, thin deep thread, and the surface covered with a metallic skin.

THE BARNES MFG. COMPANY, New Haven, Conn., for whom Horace F. Sise is Western agent, 114 Chambers street, New York, issue a circular relating to their Yale Pattern Night Latches, which embody a recent patented improvement. These Latches are recommended for their simplicity and the ease with which they can be applied. The circular gives a full description of their special features.

THE TRADE WILL REGRET to learn that the McCosh Iron and Steel Company of Burlington, Iowa, have become involved in financial trouble and will hope that it will not prove serious. The company have made a fine record as one of the most progressive manufacturing establishments in the West. The company were incorporated January 1, 1884, with a capital stock of $200,000, which was increased to $500,000 in 1890. Indications, we a re advised, point to an amicable adjustment of the matter. On the 24th inst. Charles W. Rand was appointed temporary receiver for the company. The motion for appointment of a receiver and foreclosure of the $225,000 mortgage will be argued before Judge Casey some time this week.

KENTUCKY BELL COMPANY, Louisville, Ky., issue a circular announcing that they are prepared to furnish promptly their new low-priced Western Kentucky Stock Bell, the durability, strength of tone and finish of which are referred to. Desiring to give this new Stock Bell a place in the market, they state that they have made the price as low as is consistent with good quality and good workmanship. The same circular gives the list prices of their J. Geo. Dodge's Kentucky Bells.

It is Reported—

That Rapp & Fisher, Oxford, Iowa, are erecting a fine brick business block at Iowa City, Iowa, part of which they will occupy as a Hardware store. The estimated cost is over $5000.

That the West Superior Hardware Company, Madison, Wis., have changed their name to the Wurdeman & Swanson Company. The business will be removed to Houlton, Wis.

That Schou & Phillips' Hardware store at Poughkeepsie, N. Y., was burglarized on the 16th inst.

That Samuel A. Coldwell has sold his Hardware business at Matteawan, N. Y., to John C. Burney.

That Capt. D. N. Bennett has sold his interest in the Hardware firm of Smithdeal & Co., Norwood, N. C.

That the Hardware stock of A. C. Snyder, York, Neb., is being rapidly removed to its new quarters.

That Joseph Holman has opened a stock of Hardware at Rolling Home, Mo.

That the Hardware firm of Voelkel & Beneke, 1138 Magazine street, New Orleans, La., has been dissolved. John O. Beneke has assumed the liabilities and assets of the old firm and will continue the business at the same stand.

That the Brunswick Hardware Company, Brunswick, Ga., were burned out on the 20th inst.

That A. L. Bostwick and Allen Baldwin of Bathgate have purchased the Hardware store and stock of Wilcox & Flett, Neche, N. D.

That the Hardware store of H. I. Adams at North Bend, Neb., was robbed on the 14th inst.

That Bowle's Hardware store at Paoli, Ind., was destroyed by fire recently.

That M. Murphy & Co.'s Hardware store, Brainard, Neb., was broken into by thieves on the 14th inst. and their entire stock of Pocket Knives and Razors taken.

That Wolf & Bros., Altoona, Pa , are rebuilding their Hardware store.

That M. A. Lisk of the firm of Bostwick & Lisk, Hardware merchants at Clifton Springs, N. Y., has sold his interest in the firm to S. W. Pitts.

That Denny Bros., Hardware dealers, Reidsville, N. C., were robbed on the 13th inst., Pistols, Pocket Knives, Razors and Shears comprising the stolen booty.

Arrangement of Stores.

Bindley Hardware Company.

PART II.

THE PRESIDENT'S office, as shown in Fig. 690, is reached through the hall from the reception room. From the president's office is a line of speaking tubes to the order clerk's office, with branches to treasurer's general office, billing, buying and sales departments, each being called by a different signal. Through the medium of the order clerk's call and tube the president can converse with any or all floors or departments, and *vice versa*. At the extreme rear of the offices is a fire-proof vault, 10 x 10 feet, with another of the same dimensions directly below in the basement. The latter is used for superannuated books and records. On the opposite side of the sales room from the offices, and immediately adjoining the receiving and shipping room, is the order department, Fig. 691. When credits have been approved all orders are referred to this office, and in turn they are transmitted to each floor by dumb waiters for attention. The dumb waiter, as shown in the cut, is made of tin; an elongated box, with conical ends, fastened on steel sash ribbon, which is run on sheaves at top and bottom. It is evenly balanced, and one pull will send it three floors. The chief order clerk also has communication by electric bells and tube with each floor and department. He holds each of his subordinates responsible for the time he retains each order, by stamping thereon the hour and minute it is sent to his department, and requires a corresponding record thereon of the time it was completed and retransmitted to his office. Thus he retains entire control and supervision of the orders in their different stages of completion. In this office are two telephones, at which two girls are steadily employed, and here is the headquarters or desk of the city buyer or pick-up man. The space on this floor unoccupied by offices is devoted to samples and sales. In convenient places salesmen's desks are placed, each having one; counters with showcases are placed at intervals. Sample boards are placed around the metal columns on hinges so that they open like leaves of a book, are easy of access, convenient, occupying little space, and also have the recommendation of being sampled on both sides. The sample boards, Fig. 692, are plain pine boards, 2½ x 4 feet, covered with black cheese cloth, so that the removal of samples does not show any disfiguration of the boards by exposure of screw holes or other unsightly indentations. The outer edge of the board is trimmed with a small oak molding to correspond with the wood work of the room. The samples are secured to the boards by screws, double-pointed tacks or wire, as is most appropriate. Sample racks, Fig. 693, for Tinware and Agate Ware, are on casters, so they can be moved around on the floor. The position of these racks can be changed on the floor, and thus continually present to their every-day callers a new floor arrangement of samples, not allowing the appearance to any extent to become monotonous, which occurs in a perpetual sameness or stated position of samples. The samples are arranged on

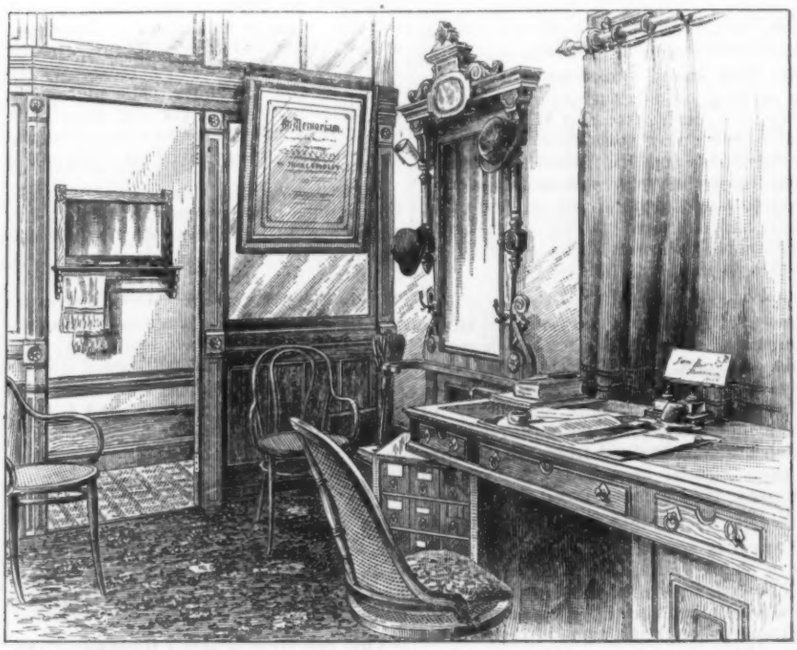


Fig. 690.—The President's Office.

Fig. 691.—Order Clerk's Office.

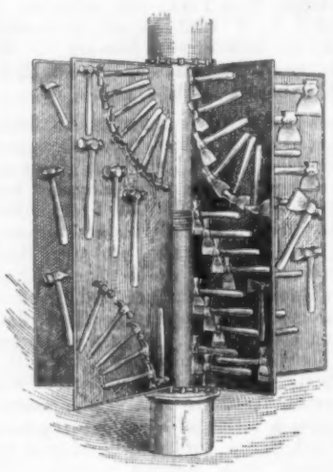


Fig. 692.—Sample Boards.

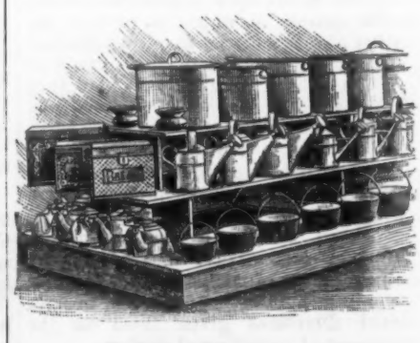


Fig. 693.—Sample Rack.

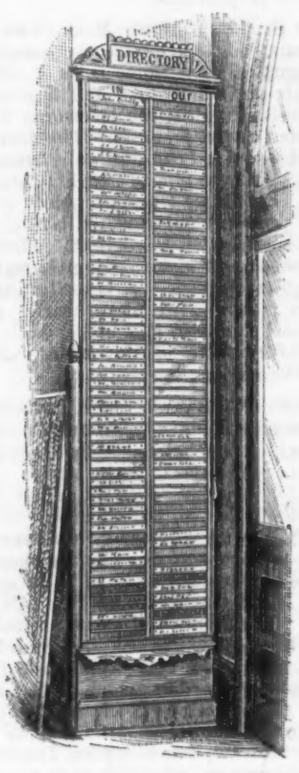


Fig. 694.—Directory.

each side of four aisles, and are all made up of different lines of goods or samples. A buyer desiring to see a line of goods can be accommodated with that certain line of goods entire while he remains in the aisle. Permanently located at the Seventh avenue entrance is their directory, Fig. 694. This is a useful as well as an ornamental case, 9 feet high, divided into two spaces marked "In" and "Out." Boards, on which are the officers' and employees' names, are arranged to slide either way. Each places his name under the proper heading, either "in" or "out," as the case may be. The directory thus indicates without further inquiry whether any certain person is in the building. It is also useful in finding out the condition of help in the different departments at a glance, as well as being an incentive to those who are inclined to be tardy to make connections with their departments at the proper hours. The packing room, Fig. 695, is on the third floor, midway in the building, and of equal access from all floors. Platforms are provided on which to lay out orders, which renders the work much easier for both clerks and packers than if the goods were placed upon the floor. The Cutlery department is on the second floor, partitioned off and fitted up for this particular line. Next to this department is a show room for fine Builders' Hardware, in which are placed cases of drawers or boards, on which are sampled trimmings of the newest designs, corresponding with the different woods or finish of buildings or residences. The air shaft, shown in Fig. 687, supplies fresh air from 20 feet above the roof, it being brought in by a Buffalo blower. It is heated in winter, and distributed through the building The air is renewed in the rooms and offices every five minutes. In summer the air is supplied cold. The building is heated by steam, and natural gas is used as fuel. In the basement is a Nail keg hoist, being an endless chain with arms, placed on frame work. The hoist is run by a direct 5 horse-power engine. Leading to the hoist are skids, and kegs of Shoes or Nails are sent hither, and without further labor are picked up by the hoist and delivered on the sidewalk, ready for loading, at the rate of 20 a minute. It is apparent that great care has been exercised in the arrangement of all departments, and this description will doubtless furnish new and practical suggestions to many of our readers.

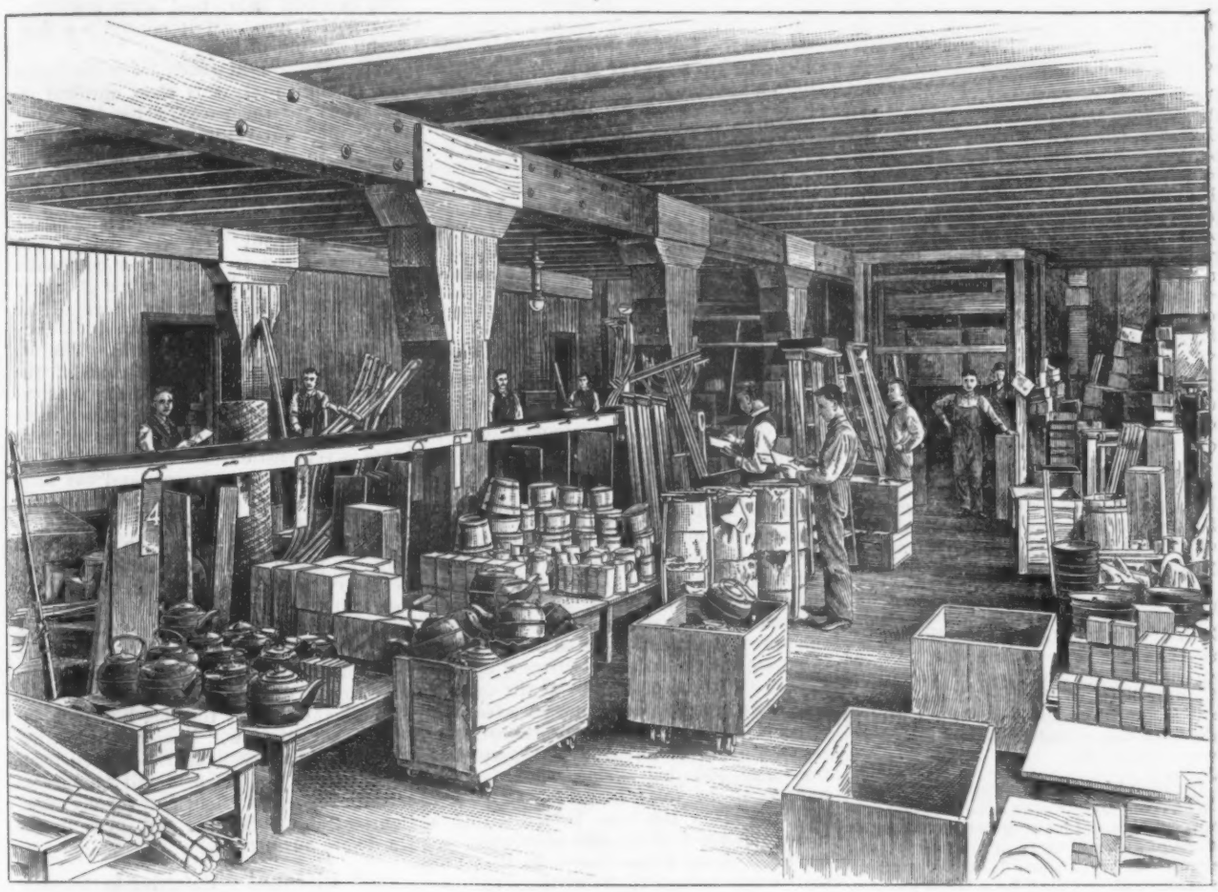


Fig. 695.—Packing Room.

Price-Lists, Circulars, &c.

RUSSELL, BURDSALL & WARD, Port Chester, N. Y.: Bolts and Nuts. This catalogue is of convenient size and elegantly printed. It contains illustrations and price-lists, with *fac-simile* in colors of the labels used on the packages. These labels show the size and quantity of goods in plain, legible figures. The manufacturers state that in order to convey a clear idea of the varieties of Bolts they are best prepared to supply, they have illustrated the catalogue with correctly proportioned cuts It will be received with pleasure by the trade, as representing in an attractive form a leading line of goods.

MERIDEN BRITANNIA COMPANY, Meriden, Conn.: 1847 Rogers Bros.' Spoons, Forks, Knives, &c. The manufacturers in referring to this, their No. 36 catalogue, state that they have endeavored to make it a complete Spoon and Fork catalogue, with press work up to the highest standard. The work contains nearly 170 pages of finely calendered paper, bound in stiff covers, on which the lettering is in silver. The first 100 pages are devoted to illustrations showing flat goods of all descriptions in 16 or more different patterns, some of the plates being on tinted pages. A price list of eight pages follows the illustrations. This is printed on colored paper to be readily distinguishable from the remainder of the book; and the preceding pages are so arranged that the price list may be turned to at once without trouble. Following the price list are illustrations, descriptions and prices of quadruple plated Table Cutlery. The index occupies the inside page of the back cover. No effort appears to have been spared in making the catalogue elegant, convenient and complete in all its details. In connection with this catalogue is their No. 37 abridged pocket price-list, bound in the same style as the larger book. Ruled blank pages are introduced, of ledger paper, for the convenience of dealers in noting net prices or other memoranda.

J. BARDSLEY, 149 and 151 Baxter street, New York: Checking Spring Hinges, Wood Door Knobs, Door Stops, &c. It is stated that the mechanism in the Double-Acting Spring Hinges is very strong, and designed with a view to great durability; it is contained in a closed iron casing which is set into the floor, or sill under the door; a brass plate covers this, and the plate is all that is seen. It is claimed, among other things, that the Hinge does not swing the door violently, but closes it gently and without noise, and stops it at once at the center. The Wood Door Knobs are made of selected thoroughly-dried material, with trimmings of solid

bronze. It is claimed that the shank is so fastened to the head of the Knob as to render it impossible to come loose. Knobs are made of all the hard woods, finely and durably finished in box, round and ball patterns. Referring to the Base Knobs, it is stated that the rubber tips are put in in an improved manner, and are not liable to drop out.

THE CHAMPION IRON COMPANY, Kenton, Ohio: Fence catalogue, No. 12. This book, containing 116 pages, gives illustrations and descriptions of Fences, Cemetery Entrance Gates, with arch, Sliding Gates, Ornamental Drive and Walk Gates, Cemetery Vault Gates, Cemetery Lot Fences, Fence Posts, Crestings, Vanes, Finials, Vases, Settees, Chairs, &c. Particular attention is given to the manufacture of jail and structural Iron Work.

ST. JOSEPH PUMP COMPANY,, St. Joseph, Mo.: 1891–1892 catalogue of the Perfection Water Elevator and Purifying Pumps and Rubber Button Chain Pumps. The manufacturers state that they guarantee their goods to be just as represented, and that all orders to the number of 50 Elevators will be shipped within 36 hours after receiving specifications.

READING IRON COMPANY, Reading, Pa.: Tube Works Department. Steam, Gas and Water, Oil Well Tubing, Casing, Line Pipe, Drive Pipe, Boiler Tubes, &c. They also manufacture Tubular goods for special purposes, as follows: Flanged End Pipe, Special Ammonia Pipe, Coiling Pipe, Ice Machine Pipe, Ammonia Cylinders, Special Locomotive Pipe, Locomotive Dry Pipe, Water Grates, Car Heating Pipe, Special Pipe for Agricultural Machinery and Tuyere Pipe. Price-lists and tabulated matter of the goods are given.

E. T. BARNUM, Detroit, Mich.: No. 443 Builders' Catalogue of Wire and Iron Work, comprising art illustrations of Roof Crestings, Balcony Railings, Stairways, Stable Fixtures of all kinds, (a specialty with him,) Window Guards, Sidewalk Gratings, Jail Cell Work, Iron Beds and a very large line of Builders' Iron Work. The systematic arrangement of its price-list is referred to as facilitating the doing of business by mail all over the country.

BUHL, SONS & CO., Detroit, Mich: Current price-list of season goods. Under date October 15 are given illustrations and price lists of Skates, Sleigh Bells, Coal Sieves, Snow Shovels, Slaw Cutters, Peeler Rasps, Lumber Tools, Razors, Carvers, Guns, &c.

THE HUNTER ARMS COMPANY, successors to L. C. Smith, Fulton, N. Y.: Breech-Loading Guns. The manufacturers state that the popularity of their Gun is largely due to its strength and durability, which has been demonstrated by a large number in the hands of professional shooters, having stood the test of three years at the trap and in the field. They claim that they have yet to learn of one which has become loose or shaky, and that many of them have a record of upward of 20,000 shots, loaded with the powerful charges common to that class of shooting.

THE NEVERSLIP HORSESHOE COMPANY, Boston, Mass.: The Neverslip Horseshoe. These Shoes have removable steel-centered and self-sharpening calks. The calks are made in five sizes and of the following shapes: Long sharp, half blunt, short sharp, slotted headless screws and blunt calks. The calks are described as being made with a core of hardened steel, with an outside covering of soft metal; are round, and are adjusted with the Neverslip wrench. They are screwed into holes properly located in the Shoe. Sharp or blunt calks are put in the Shoes as occasion requires by the owner, thus saving expense and delay at the hands of a horseshoer.

GEO. R. OSBORN, Bridgeport, Conn., and 335 Broadway, New York: Embossed Metal Goods. These consist of Album Easels, Banner Stands, Cup and Saucer Hangers, Lamp Screen Holders, Placque Hangers, &c. Referring to the catalogue, the manufacturer states that it is made up on "very peculiar principles—viz., there are no driftwood, deadwood or fillers represented, only live selling goods." It is stated that all the goods are manufactured by this house, are from devices, designs and methods of construction positively original with them.

CRAIGHEAD & KINTZ COMPANY, 33 Barclay street, New York, and Ballard Vale, Mass.: Artistic Bronzes, Metal Goods, Piano and Banquet Lamps, Oil Fixtures, &c. A catalogue with illustrations and price-lists of Inkstands, Paper Knives, Paper Weights, Photograph Frames, Lampadariums, Candelabras, Candlesticks, Thermometers, Mirrors, Pitchers, Music Stands, &c. These goods are made in gold, silver, antique brass and oxidized silver. Elegance of design, together with the large variety of patterns shown, make it a desirable medium to select from. The work is handsomely printed, and bound in style corresponding with their other catalogues.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, Ill.: Silver Plated Flat and Hollow Ware. They state that this issue of their Silver-Plated Ware catalogue contains a more complete assortment of plated staples and novelties than ever before The assortment is largely selected from the Derby Silver Company's line, but other manufacturers' goods are also shown. The book is designed as one for reference during the coming holidays.

Trade Topics.

How Orders are Filled.—The following account of the process through which an order goes between the time when it is taken by the traveling salesman and the receipt of the goods in the retailer's store, for which we are indebted to a correspondent in Ohio, will be of interest:

Not many merchants think of the various hands the Hardware order, which they have just given the gentlemanly agent, passes through before the goods are unloaded at their door. After taking the order, the agent, if he is an enterprising fellow, immediately writes it up and deposits it in the post office at the earliest possible moment. Sometimes we fear the order is forgotten in the absorbing interest of a game of billiards at the hotel or the afternoon ball game, should there happen to be one; however, supposing that the order has been posted within a reasonable time, there still remains an interval of from three hours to three or more days, according to distance and expedition of the mails, before it reaches the office of the jobber.

By this time it has gained the company of a great many others wanted in as short a time as it. These are all opened, read and "O. K.'d" by the man who looks after the credits, and then pass into the operating department. If it should be in a particular hurry it will be stamped with a prominent "Rush," and if large is divided into parts of two or three sheets each. Now the "hustler," that crude specimen of an embryo Hardwareman, takes the order in hand, and, trundling his box truck before him, is "hustling" with various degrees of activity, according to the "nature of the brute," from shelf to shelf in various parts of the house, going from floor to floor in succession.

It may require from two hours to a day to complete this stage of the work, according to the ability of the "hustler" and the class of the articles. The order is now laid out upon the floor of the packing room, and the sheets are turned over to the "short" man, who goes around through the house looking for the goods that have been reported out and putting in any that have been received in the interval, after it has been turned in. He is the man to blame for any substituting that may be done. In the best regulated houses it is impossible to keep the stock full, and on four-fifths of the orders there are always some goods which are not in stock.

As the jobbers are anxious to fill the orders complete, they are compelled to go to their neighbors and buy these goods. There is a city buyer for this purpose, and as he has to buy the "shorts" on a great number of orders daily, it can readily be understood how this will require some time; besides, a great many merchants will order goods entirely out of the Hardware line, and ask to have them gotten "as an accommodation." Any one who has not been a city buyer can scarcely appreciate the variety and extent of these special requests; for instance, he frequently has to buy such articles as bags of coffee, bolts of calico, needles, barrels of salt, sugar, watches, and so on *ad infinitum*. This is a bad habit that some customers have gotten into, and it consumes a wonderful amount of time.

After the bought goods are in the house and in the order, it is then checked off and ready for the packer's hands. After being put in shipping condition, it is trucked to the shipping room, a bill of lading made out, and it is hauled to the depot, there, perhaps, to lie for a day or two, according to the tender mercies of the railroad company. Of the delays and blunders of the transportation companies we will not speak here. Suffice it to say the jobbers are blamed for much of the carelessness and mistakes for which they are not in any way responsible. The order sheets then pass into the hands of the bill clerk, and the bill is usually sent the same day. As the mails are so much more reliable and expeditious than the freights, there is very little cause for complaint as to time in this department, and the merchant has his bill some time before receipt of the goods.

It has been our object to explain as fully as possible the different processes necessary to the complete filling of an order, and we should like to call attention to the fact that the jobbers are as anxious to give prompt and careful service as are their customers to receive it. Occasionally an order is overlooked and fails to pass through the regular routine, but such instances are very few. If an order does not come within a reasonable time, a courteous letter written to the firm will be sure to accomplish more than a stormy one. Courtesy and politeness pay, even in the Hardware business.

Cash Discount.—Referring to the question with reference to the taking off of the cash discount in the case referred to in an inquiry which appeared in *The Iron Age* September 24, we have the following from a New Jersey Hardwareman:

Concerning the question as to where to take off the 2 per cent. for cash when freight is allowed and paid by the consignee: At first blush it would seem the proper thing to take off the freight and then the cash discount. This, however, is not right, because in so doing you lose 2 per cent. on the freight bill on which you have advanced the money. It is just like buying 98 cents in pennies with a silver dollar, or a paper one for that matter.

Poor Packing.—The matter of defective packing still continues to attract attention, and while some manufacturers are making improvement in the way in which their goods are wrapped and boxed, the trade are also ready to suggest improvements which might be made in this direction. In the following communica-

tion from a correspondent in Ohio some instances of inconsiderate packing are alluded to:

The discussion of the subject of packing brings to mind a few specimens of ornamental work of this kind rather out of the usual line. One of them was a box of returned goods received by a Detroit jobber, in which he found Sad Irons and Brass Bird Cages packed together. The Sad Irons were uninjured. The receiving clerk in another house was badly scared on opening a case of returned goods to find it contained Picks and Cartridges, the Cartridges having gotten out of the boxes and scattered loosely among the Picks In another instance a Baseball Bat was to be sent with an order as a present to a customer's son, but the box was too short to take it and the packers sawed several inches off one end of the Bat, to the disgust of the man making the gift.

There is probably no part of the process of manufacturing that receives more attention than the finishing and packing, and it is to be regretted that the attention at times seems to be mainly in the way of reducing the cost at the expense of appearance. There are many chances for waste in this department, and it is well to look closely to the expenditures, but it is easy to spoil the effect of the most careful and painstaking work in other departments by poor finishing and cheap packing.

A customer has a higher opinion of goods that show that the manufacturer considers them worth handling carefully, and on general principles prefers a well put up article. For instance, take two Axes of the same grade, one wrapped in a piece of tissue paper, the edge protected by a wedge with a V-shaped slot, and put in a neat pasteboard box, and the other Axe simply wrapped in glazed Hardware paper. Open them up before the ordinary woodchopper, and he will pay more than the difference in the cost of the packing to get the Axe in the neat box. Or take a box of Padlocks, each wrapped separately in paper, some of which have been unwrapped to show to customers and hastily thrust back into the rumpled paper. The next customer will want to see one of those in a neat paper and if shown one of the others will probably be dissatisfied until he gets hold of a fresh one The same idea applies to all lines, and any pains taken to get the goods before the consumer in first-class shape and appearance will be well taken.

Exports.

ADDITIONAL SHIPMENTS PER SHIP TENASSORIN, FOR SYDNEY, N. S. W.

By Atlas Tack Company.—16 cases Nails, 3 boxes Tacks.
By W. H. Crossman & Bro.—2 barrels Hoes, 3 cases Transom Lifters, 23 packages Hardware.
By Edward Miller & Co.—57 packages Lamp Goods.
By V. Basanta.—20 dozen Saws.
By R. H. Dana & Co —19 cases Handles.
By R. W. Forbes & Son.—4 cases Carriage Bolts, 2 cases Carriage Bolts, 4 cases Hardware, 5 packages and 5 cases Hardware, 4 cases Hardware.
By S. Hoffnung & Co.—15 cases Axes, 1 case Tools, 3 cases Sweepers, 6 packages Lamp Goods, 8 cases Saws, 3 casks Lamp Goods, 2 boxes Tacks, 125 dozen Sledges, 1 case Traps, 1 case Brushes, 5 cases Braces, 2 boxes Wagon Jacks, 12 packages Lamp Goods, 6 cases Wringers, 5 packages Vises and Hammers, 1 case Saw Sets, 6 crates Churns, 2 cases Washita Stone, 23 packages Lamp Goods, 1 case Cutlery, 11 packages Hardware, 4 barrels Bells, 2 boxes Hoes, 114 boxes Tools.
By Arkell & Douglas.—10 reels Wire, 12 kegs Nails, 1 case Brushes, 6 cases Metal Polish, 5 racks Churns, 265 bundles Wire, 18 cases Guns, &c., 25 cases Axes, 6 packages Lampware, 27 cases Tools, 13 packages Traps, 6 cases Stone, 36 cases Tacks, 10 cases Bolts.
By Australasian-American Shipping Company.—28 cases Axles, 2 cases Loading Tools, 27 cases Metal Polish.
By H. W. Peabody & Co.—1 box Nails, 1 box Tacks, 7 cases Hardware, 1 case Metal Polish, 2 cases Brushes, 2 cases Metal Polish, 1 case Brushes.
By Ilsley, Doubleday & Co.—3 cases Hardware, 1 case Brushes, 6 cases Iron Bolts, 3 cases Hardware.
By Australasian-American Shipping Company.—1 case Bolts, 4 cases Hardware, 1 case Broilers, 1 case Carriage Hardware, 4 cases Saws, 2 cases Meat Choppers, 1 case Hammers, 1 case Saddlery Hardware.

PER BARK AMY TURNER, OCTOBER 12, 1891, FOR ADELAIDE, AUSTRALIA.

By H. W. Peabody & Co.—2 cases Hardware.
By Edward Miller & Co.—20 packages Lamp Goods.
By McLean Bros. & Rigg.—3 cases Hardware, 1 case Saw Sets, 1 case Hammers, 3 cases Hatchets, 1 case Files, 2 cases Saws, 1 case Mangles, 4 cases Choppers, 6 cases Axes, 1 case Saws.
By R. H. Dana & Co.—1 case Drills, 5 cases Meat Choppers, 3 cases Hardware, 1 case Hay Knives, 2 cases Shovels, 1 case Hammers, 15 cases Wringers, 1 case Picture Cord.
By Mailler & Quereau.—200 reels Barb Wire.
By McLean Bros. & Rigg.—1 case Brads, 1 case Saws, 1 case Bench Screws, 1 case Axle Wedges, 4 cases Carpet Sweepers, 1 case Wrenches, 11 cases Wringers, 1 case Door Springs, 1 case Planes, 5 cases Files, 1 case Saw Sets, 2 cases Axles, 1 case Pumps, 1 case Tire Bolts, 6 cases Stocks and Dies, 1 case Mouse Traps, 8 cases Granite Ware, 1 case Gun Tools.
By Henry W. Peabody & Co.—7 cases Hardware, 4 dozen Wringers, 5 cases Agate Ware, 1 case Mouse Traps, 5 cases Cartridges.
By W. H. Crossman & Bro.—2 cases Hatchets, 1 case Pump Parts, 1 case Bicycles, 1 case forges, 8 packages Lamp Goods, 2 cases Hardware, 1 case Hardware, 5 cases Hammers, 1 case Braces, 6 packages Axes, 25 packages Hardware, 1 case Sandpaper, 3 cases Hardware, 1 case Saw Sets, 100 cases Loaded Cartridge Shells, 54 cases Axes, 18 cases Wringers, 6 cases Hardware, 2 cases Bench Screws, 1 case Traps, 4 cases Hardware, 6 cases Club Shells, 23 cases Cartridges and Primers, 1 case Reloading Tools, 3 cases Rifles, 4 cases Paper Shells, 1 case Fire Arms, 8 cases Lamp Goods.
By J. A. Clifford.—4 packages Hardware.
By Reed & Barton.—2 casks Plated Ware.
By Coombs, Crosby & Eddy.—1 case Tools, 3 cases Guns.
By Hartley & Graham.—28 cases Cartridges, 2 cases Empty Shells and Caps, 1 case Gun Parts
By H. W. Peabody & Co.—13 cases Meat Choppers, 1 case Washers, 4 cases Wringers, 9 packages Meat Choppers, 3 cases Hardware, 1 case Axe Handles, 1 case Granite Ware, 1 case Bicycles, 21 packages Hardware, 1 case Farming Implements, 1 case Silver Ware, 5 packages Pumps, 42 Packages Hardware, 1 package Revolvers, 4 cases Oil Stone, 5 case Agate Ware, 4 cases Carpet Sweepers, 15 packages Hardware, 12 cases Wringers.

PER BARK WAALAND, OCTOBER 16, 1891, FOR CHRIST CHURCH, NEW ZEALAND.

By Edward Miller & Co.—11 packages Lamp Good.
By Atlas Tack Company.—6 cases Nails.
By Hartley & Graham.—1 case Rifles, 1 case Empty Cartridge Shells, 1 case Caps and Cartridges, 12 cases Cartridges.

FOR LYTTLETON.

By Arkell & Douglas.—3 cases Drills, 4 cases Wringers, 1 case Cork Pullers, 3 cases Horse Nails, 2 cases Tacks, 18 cases Cartridges, &c., 1 case Fire Arms.
By R. W. Forbes & Son.—1 box Hardware.
By R. W. Cameron & Co.—9 boxes Axes, 1 case Handles, 1 case Tools, 1 case Hammers, 2 cases Mangles, 3 cases Wringers, &c., 5 cases Hardware, 2 cases Meat Choppers, 4 packages Whetstones, 1 case Wrenches, 1 case Nails, 1 case Saws.
By Henry W. Peabody & Co.—3 cases Hardware, 4 cases Wringers, 10 cases Hardware, 1 case Traps, 1 case Nails, 3 cases Wringers, 5 racks Churns, 1 case Farming Implements, 14 packages Hardware, 21 cases Ammunition, 3 dozen Wringers, 4 cases Hardware, 3 cases Wringers, 2 cases Lanterns, 1 case Egg Beaters, 100 reels Barb Wire, 1 case Edge Tools, 1 case Brushes, 1 case Wire Ware, 35 packages Hardware, 1 case Farming Implements, 3 cases Traps, 1 box Plated ware, 2 cases Churns, 1 case Oil Stoves, 2 cases Nails, 12 cases Rat Traps, 33 packages Ammunition, 1 case Pumps, 1 dozen Scoops, 5 cases Store Trucks, 1 cask Pumps, 3 cases Scales, 4 cases Hardware, 2 packages Hardware, 6 cases Hardware, 2 cases Oil Stone, 1 case Nails, 4 cases Tools.

FOR NAPIER.

By Hartley & Graham.—6 cases Cartridges, 1 case Caps and Cartridges.
By Henry W. Peabody & Co.—34 packages Hardware, 9 packages Farming Implements, 1 case Egg Beaters, 1 case Axles, 4 crates Churns, 30 packages Hardware, 6 cases Wringers, 2 cases Wire Mats, 1 bundle Sash Cord, 2 cases Lampware, 2 cases Coffee Mills, 5 crates Churns, 1 case Rakes, 5 packages Hardware, 5 cases Corn Shellers, 1 case Pumps, 2 cases Handles, 1 crate Oil Stoves, 4 tons Barb Wire, 1 crate Handles, 1 case Carpet Sweepers, 1 case Hammers, 6 cases Bush Hooks, 1 case Bolts and Nuts. 4 cases Hardware, 1 case Emery Wheels, 1 case Bolts, 1 case Brushes, 5 cases Hardware, 60 reels Barb Wire, 1 case Forks, 6 packages Hardware, 9 packages Hardware, 3 cases Bush Hooks, 7 cases Tools, 1 case Nails.

PER SHIP MORNA, OCTOBER 17, 1891, FOR MELBOURNE, AUSTRALIA.

By Edward Miller & Co.—37 packages Lamp Goods.
By Meriden Britannia Company.—2 boxes Silverware.
By Edward Miller & Co.—7 boxes Lamp Goods.
By W. & B. Douglas.—4 packages Pumps.
By Edward Miller & Co.—82 packages Lamp Goods.
By Australasian-American Shipping Company.—6 cases Bolts.
By St. Louis Stamping Company.—6 cases Granite Ware, 1 case Tinware.
By Simpson, Hall, Miller & Co.—2 packages Plated Ware, 2 hogsheads Plated Ware.
By R. W. Forbes & Son.—1 case Hammers, 3 boxes Scales.
By Henry Disston & Son.—11 cases Hardware, 1 case Iron Vises, 2 cases Hardware.
By Hammacher & Delius.—2 cases Pick Handles, 4 cases Clothes Wringers, 2 cases Hardware.
By Edward Miller & Co.—62 packages Lamp Goods.
By Hartley & Graham.—1 case Metallic Cartridges, 52 cases Cartridges.
By W. H. Crossman & Bro.—5 dozen Wringers, 12 dozen Hoes, 1 case Fish Lines, 1 crate Handles, 16 cases Hardware, 40 kegs Nails, 3 cases Bush Hooks, 32 cases Axes, 3 cases Tills, 2 cases Grindstone Fixtures, 4 cases Sad Irons, 23 cases Wringers and parts, 9 cases Oil Stones, 8 crates Churns, 1 case Hoes, 200 reels Barb Wire, 7 cases Oil Stones, 1 case Lamp Goods, 21 packages Hardware.
By McLean Bros. & Rigg.—3 packages Plated Ware, 50 cases Axes, 1 case Butts, 1 case Clippers, 49 cases Lawn Mowers, 1 case Tinware, 13 cases Hardware, 2 casks Pumps, 3 cases Agate Ware, 2 cases Miter Boxes, 1 barrel Lampware, 2 cases Saws, 4 cases Files, 1 case Rifles, 4 crates Wheelbarrows, 1 case Revolvers, 15 cases Plows, 1 case Tire Bolts, 2 cases Carriage Bolts.
By H. W. Peabody & Co.—134 packages Hardware, 1 case Pulley Blocks, 2 cases Pumps, 2 cases Oil Cans, 9 dozen Forks, 3 cases Hardware.
By Australasian-American Shipping Company.—15 cases Carpenters' Tools, 9 cases Axles.
By Arkell & Douglas.—9 cases Horse Nails, 193 reels Barb Wire, 31 cases Wringers, 1 case Sandpaper, 1 case Thermometers, 1 case Pencils, 1 case Stencils, 3 cases Forges, 4 cases Cartridges, &c., 1 case Bolts, 1 case Tinware, 7 cases Guns, 60 cases Tacks, 12 packages Lampware, 54 packages Hardware, 6 cases Tools, 145 cases Axes, 6 packages Lampware, 5 cases Handles, 22 cases Hardware, 5 cases Tools, 2 cases Wire Goods, 2 cases Axes, 3 cases Nails, 7 cases Bolts, 2 cases Sweepers.

PER SHIP EMILY F. WHITNEY, OCTOBER 20, 1891, FOR SYDNEY, NEW SOUTH WALES.

By W. K. Freeman.—6 barrels Lamp Goods, 1 package Scales, 1 case Drills, 8 packages and 7 cases Iron Axles.
By Healy & Earl.—6 crates Blowers, 5 boxes Hardware, 1 case Saws, 3 cases Pumps, 1 box Emery Wheels, 6 cases Scales.
By Strong & Trowbridge.—6 packages Pumps, 2 cases Hardware, 2 cases Hardware, 5 cases Emery Wheels, 35 cases Axes, 1 case Drills, 2 boxes Hardware, 1 case Hammers, 11 cases Axes and Hatchets, 1 case Hardware, 2 cases Chucks, 12 cases Lampware.
By McLean Bros & Rigg.—1 box Hair Clippers, 3 barrels Lamps, 4 boxes Hatchets, 3 cases Hames, 2 boxes Drills, 8 dozen Lanterns, 1 box Butts, 3 cases Boring Machines, 7 barrels Cow Bells, 1 case Hammers, 1 case Braces, 3 cases Cartridges, 1 case Rifles, 6 cases Scales, 6 cases Lamps, 1 case Hat and Coat Hooks, 1 case Wrenches, 1 case Plumbs and Levels.
By H. W. Peabody & Co.—6 cases Wringers, 1 case Fire Arms, 55 packages Nails, 3 cases Tacks, 2 cases Hardware, 12 cases Nails, 2 packages Lampware, 1 cases Hardware, 3 Axes, 6 cases Handles, 1 case Hardware, 1 case Hardware, 2 cases Nails,

FOR NEWCASTLE.

By H. W. Peabody & Co.—6 cases Hardware, 14 packages Lampware, 20 packages Hardware, 1 case Fire Arms, 4 racks Churns, 1 case Cartridges, 1 box Nails, 18 bundles Wrenches, 2 cases Pumps.

PER BRIG LEONORA, OCTOBER 23, 1891, FOR CAPE TOWN, SOUTH AFRICA

By W. B. Fox & Bro.—13 packages Agricultural Implements, 14 cases Meat Cutters, 3 packages Hardware.

By H. W. Peabody & Co.—1 case Scales, 84 cases Plows.

By Strong & Trowbridge.—1 case Wrenches, 6 cases Tacks, 13 cases Hardware, 72 packages Fiber Ware.

By M. Berliner.—2 cases Handles.

By Coombs, Crosby & Eddy.—12 Ladders, 1 case Carpenters' Tools, 40 reels Barb Wire, 1 case Step Ladders, 1 case Mouse Traps, 4 cases Hardware, 1 case Bracket Saws, 1 case Hardware, 1 case Saws, 1 case Drop Shot, 1 case Hardware.

By Arkell & Douglas.—8 cases Axes, 6 crates Washing Machines, 1 case Hammers, 1 case Ladders, 2 cases Saws, &c., 9 cases Choppers, 1 case Saws, 12 cases Fly Traps.

By W. H. Crossman & Bro.—1 case Pumps, 100 coils Sisal Rope, 10 packages Hardware, 1 bundle Step Ladders, 7 packages Agricultural Implements.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The situation so far as base materials are concerned remains practically the same as noted last week. Pig Lead is a shade lower and Quicksilver, on the other hand, is held at a further advance, but neither change appears to have had any effect upon the market for any of the several productions in the manufacture of which those commodities are employed, nor has the slight modification in prices of Chalk made by some importers had any visible effect. As for trade in the general line of Paints and Colors, the general report is that distribution runs along about as usual at this season. The purchases by local and near-by trade, to all accounts, hardly meet expectations, but orders received by mail from various quarters amount to considerable in the aggregate and compensate, in a measure, for the rather dull local trade. Thus far the fall season movement has been fairly satisfactory in most departments and the prospects for the remainder of the season are looked upon as being favorable.

White Lead.—The condition of the market for this pigment is unchanged. Large buyers discuss the further decline in cost of Pig Lead and the cheapness of Linseed with greater interest, as though inclined to the opinion that the corroders cannot very well avoid reducing their prices ere long. At headquarters no intimation of any impending change is given and it is considered doubtful that the list will be revised this year unless competition from inferior pigment becomes keener. Some of the better class of mixed Leads are selling at prices rather lower than those that ruled prior to the decline in Oil, but the concession does not appear to have been sufficient to divert many buyers from the corroders' product. In any event corroders state that their current sales are up to the average for the season. Taken as a whole, consumption is comparatively good, although diminishing somewhat as the weather becomes unfavorable for outdoor work.

Zincs.—There is a seasonably good trade in domestic Oxide and nothing has transpired tending to disturb the market in the slightest degree. Manufacturers maintain friendly relations and orders, while not remarkable for their size, come along in a manner that keeps the surplus down within manageable bounds. Equally as favorable report is made on foreign brands. There is enough of all kinds, yet no great surplus and no shading of prices that have ruled for some time past.

Colors.—Outside of the routine distribution there has been little, if any, movement in Dry Colors adapted to house-painters' use and Oil Colors are equally as free from change. Grinders' Colors have been meeting with fairly good sale, the movement in some lines being a little freer than last week. Values are showing few and only unimportant changes.

Miscellaneous.—Block Chalk in bulk is offered at slightly lower prices, but the minimum figures are still above buyers' ideas, and business drags. Manufacturers are quoting the old line of prices for Whiting and Paris White, but remark that new orders are coming forward rather slowly. The situation in Putty is unchanged, competition being keen and prices irregular.

Oils and Turpentine.

About the only new feature in the Oil trade is a further depression in values of Cotton Seed products, due to freer offering as the new season advances and supreme indifference manifested by nearly all buyers. In other branches nothing has occurred that would tend to either depress or stiffen values. Buyers' operations throughout have been of strictly perfunctory character, and inquiries reveal no disposition on their part to deviate from conservative line of action. In the face of the extreme caution generally observed it would appear that the consumption, with few exceptions, is quite as full as usual at this season of the year.

Linseed Oil.—Western competition is restrained somewhat by the enhanced cost of raw material, due in a good measure to liberal export purchases. Thus far this season about 2,000,000 bushels of seed have been taken for shipment to Europe, and it is the opinion of well-informed observers that a great deal more will be moved out should prices keep at an attractive point. The outlook for cheaper Western Oil is thus not clouded, but such that crushers are more reserved in their offering. At the present time it is doubtful that small quantities would be put in at less than 36¢, and for carload lots 35¢ is apparently the inside rate. City crushers are still in the market at 37¢ for ordinary quantities, however, and the indications are that their prices will remain unchanged until it is made clear that Western competitors are practically driven out of Eastern trade.

Cotton-Seed Oils.—The leading producers and the various outsiders have been in sharp competition for business. Day after day they have cut prices upon each other, and the outcome thus far is a break to the lowest figures on record, with very little result in the way of new business. On prime quality new crude 27¢ is a common price at the moment. Some sellers would do ½¢ better, and in one instance as low as 26¢ was quoted. On refined product correspondingly low prices were made, and 32¢ is now a common rate for prime Summer Yellow, while 31¢ would doubtless be accepted. "Off" grade Yellow is offered at as low as 27½¢, and reddish stock at 26½¢, which figures are 2¢ to 3¢ below those at which similar grade of old Oil was sold last week.

Fish Oils.—In the New Bedford market about 200 barrels of crude Sperm Oil have been sold for export at 70¢, which is an advance of about 2¢ over the rate on the last previous sale. This imparts greater firmness to the market for manufaatured products, but prices for the latter are no higher. No change whatever in Whale Oils. Deliveries on old contracts are taking up all the crude Menhaden Oil that comes forward, and Pressed and Bleached products are moving out very fairly at stiff prices. Cod oil is up to 38¢ @ 40¢ and scarce.

Lard Oil.—City pressers have marked their price for prime present make Oil in ordinary quantities down to 54¢ and outside brands have been sold at 53¢. The market thus presents a weak appearance, but quite the average amount of Oil is moving out from first hands.

Miscellaneous.—Olive Oil in barrels is moving off slowly and prices are still unsettled, with the leaning in buyers' favor. Cocoanut Oils are rather weak also and finding rather slow sales. Tallow Oil and Red Oils move fairly at practically unchanged prices.

Spirits Turpentine.—The market has remained almost stationary throughout the week, in the absence of new developments at the primary points or change in the attitude of buyers or sellers here.

Some idea of the modern military arms of Europe may be obtained from the following comparison of the '71, the '84 and the '88 model of the German army. The former was 0.433 inch caliber, while the latter is 0.211, the central velocity standing as 1427 to 2034 feet a second, the range being 9840 and 12,470 feet respectively. The ball revolves 2580 times a second now as compared with 790 times for the old model. Although the new arm is only a trifle shorter, it weighs only 8.37 pounds, as compared with 10.14 pounds for the old rifle. In warfare the soldier carries 150 rounds now, against 100 formerly. At a distance of 1000 feet the new rifle penetrates ¼ inch iron, and at a range of 5250 feet goes through 2½ inches of dry pine.

The oil producers in the McDonald oil field, Pennsylvania, are astonished. Although there has been a decline in the daily flow from 60,000 to 55,000 barrels, the fact remains that even at the reduced figure this wonderful pool is still spouting petroleum at a rate that throws the records of all American fields clear into the shade. This field has in a little over 100 days yielded about 3,000,000 barrels. September production was 1,000,000 barrels, and October will be close to 1,500,000, and possibly more. The proportions of these remarkable figures will be better appreciated when it is remembered that the best previous record from one pool was made in 1882, at Cherry Grove, when, for a few days, the output reached 40,000 barrels.

Plenty of talk is coming from Detroit relative to building new boats during the winter. Among those reported as negotiating with the Detroit Dry Dock Company for the construction of steel steamers are Frank Perew of Buffalo, A. W. Goodrich of Chicago, and Manager Ricketson of the Interocean Transportation Company. Mr. Perew, who is the managing owner of the steamers A. P. Wright and John B. Lyon, is seeking bids for a steel boat. For the Interocean Transportation Company a mate to the steamer Maryland is needed in carrying iron ore from Escanaba to South Chicago. The Goodrich Line is said to be figuring on a mate to the Virginia, to alternate with that boat on the Chicago and Milwaukee route. It is believed that most of these projects will result in contracts being signed at an early day.

A higher price-list has been adopted recently on boat spikes by the associated makers.

The *Moniteur Industriel* recommends the use of a mixture of oil and graphite on all screws in machinery. It says it will effectually prevent them from becoming txed, and protects them for years from ust; at the same time the mixture facilitates tightening up.

Grant's Orange and Lemon Peeler.

Gaynor & Mitchell Mfg. Company, 245 Water street, Bridgeport, Conn., are introducing this novelty, as shown in Fig. 1. It is made of steel wire, nicely nickel

Fig. 1.—Grant's Patent Orange and Lemon Peeler.

plated. The manufacturers state that when the point of the hook is drawn into the fruit, as in Fig. 2, it slides between the pulp and peel without danger of entering either, while the blade divides

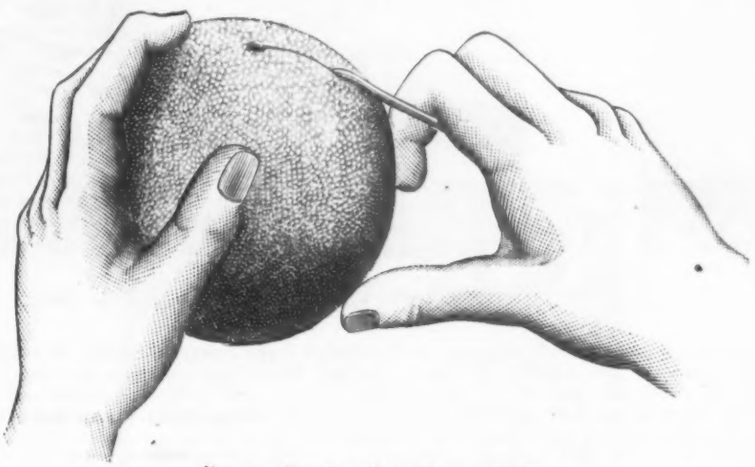


Fig. 2.—Showing Operation of Peeler.

the peel easily, rapidly and positively, after which the peel may be removed without trouble. It is claimed that 1000 oranges may be peeled without soiling finger or glove, should a glove be worn, nor a drop of juice lost, and that peeling oranges with the peeler becomes a pleasure.

Eclipse Wrench Attachment.

Prentiss Vise Company, 44 Barclay street, New York, are introducing this attachment, as illustrated in Fig. 1. It con-

Fig. 1.—Eclipse Wrench Attachment.

sists of a drop forging, handsomely finished, with a spring attached for holding it in place on the wrench, as shown in Fig. 2. It is readily slipped on or off a wrench, and it is claimed will instantly convert any ordinary screw wrench into a

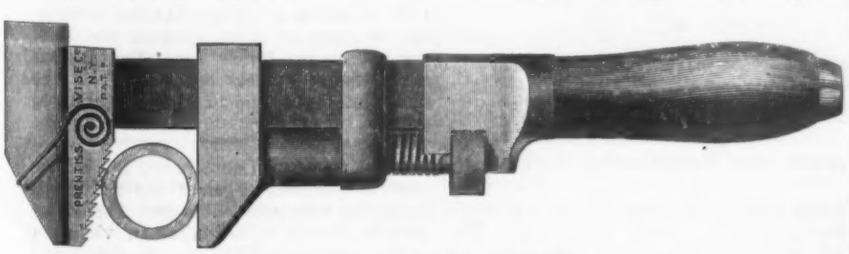


Fig. 2.—As Applied to Wrench.

first-class pipe wrench, capable of doing all the work required of such a tool. The attachments are made in five sizes, to fit 8, 10, 12, 15 and 18 inch screw wrenches.

Generator and Bell.

Joseph F. Bray & Co., 221 Eighth avenue, New York, are introducing Gillette Magneto Electric Generator and Bell, as illustrated in the accompanying illustrations. The generator is furnished in a nickel-plated round box, with hard-wood top and bottom, the box being 4½ inches deep and 5 inches in diameter. With this generator there is no battery used, either dry or liquid, but it is operated by the 2½-inch crank on the top. It may be placed in any position ordinarily occupied by a push button, and be connected by wires to

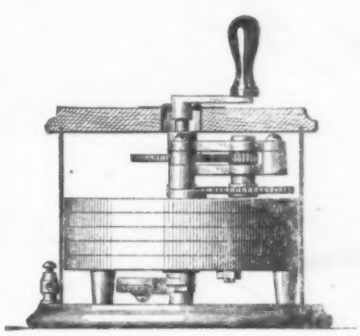


Fig. 1.—Magneto Generator.

bells, annunciators, semaphore, door openers, &c. The bell, as shown in Fig. 2, in connection with the generator, completes the call-bell outfit as sold by this firm for front-door or other call-bell work. The advantages of this generator, as claimed by the manufacturers, are that there are no liquids to freeze or spill; that it requires no attention, and that it will stand exposure to all kinds of weather without harm.

The runner attachments manufactured by Wyeth & McCulley, Newark, Ohio, for all kinds of vehicles, including two wheelers, are made for axles from ⅞ to 2¼ inches. They are made adjustable, narrow

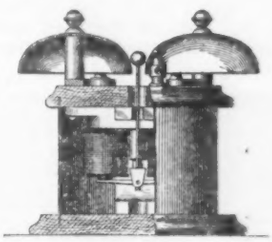


Fig. 2.—Electric Bell.

or wide track; special drop rave, adjustable, narrow or wide track, and wide track. These goods are finished in black or vermilion, as desired, and provide a convenient substitute for wheels during the time of sleighing.

Magic Oscillating Curry Comb.

The Chieftain Company, Canton, Ohio, are introducing this article as illustrated in Fig. 1. The handle is of malleable iron, japanned black, arranged to be held

Fig. 1.—Magic Oscillating Curry Comb.

by the thumb and little finger, as shown in Fig. 2.

The blades are of spring steel, japanned brown, pivoted in circular form to the back, by means of one long rivet running through the three blades. The notches in the back hold the blades in place, yet permit them to rock or oscillate upon the rivet. It is claimed that the comb is self-cleaning and does not require to be cleaned by knocking; that the blades, being of tempered spring steel, are not

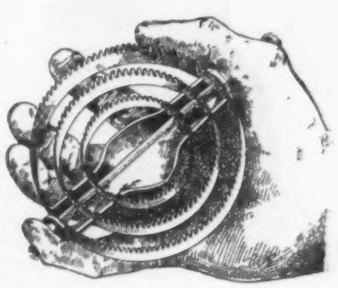


Fig. 2.—Manner of Holding Curry Comb.

liable to have the teeth bent or broken, and that its construction permits the blades to pass over the uneven places without pain or injury to the horse.

To introduce this comb the manufacturers will mail one to every dealer or horse-owner upon receipt of 16 cents in stamps to cover postage and packing.

Empire Door Closer.

Richmond Safety Gate Company, Richmond, Ind., are offering a door closer, as shown in Fig. 1. It has a spring of oil-tempered steel, with a chain of solid copper to insure strength and durability. The whole is bright nickel-plated, presenting a neat and attractive appearance. It is claimed that the principal feature of the closer is that when the door is widest open the extra strain is removed from the spring, and that as the door nears the closing point the full force of the spring is applied, thereby insuring the door to shut noiselessly, yet being sure to shut. It is designed for all kinds of doors, light, medium and heavy, and will also operate on the inside of the door, Fig. 2. The closers are all put up with the spring placed in the barrel to close a door as shown in Fig. 1; and when desired to change for the opposite side, or to the other hand, the pin at the top is removed and the spring reversed.

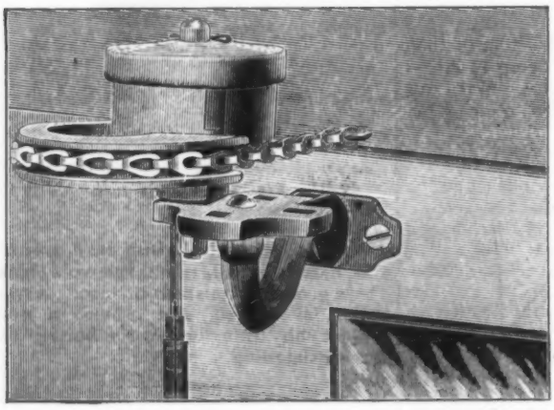


Fig. 1.—Empire Door Closer.

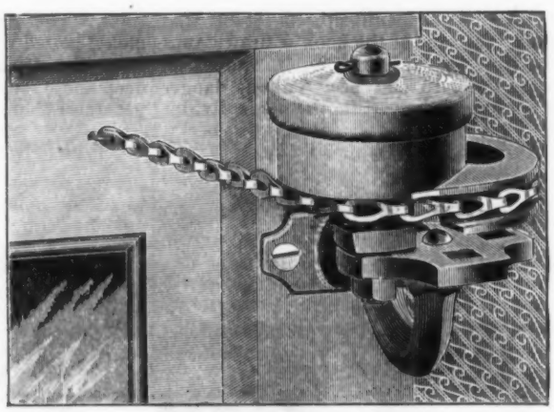


Fig. 2.—As Operated on the Inside of the Door.

The largest steam shovel in the world is digging out phosphate in the mines at John's Island, near Charleston, S. C. Its weight is 56 tons. It can dig to a depth of 10 feet below its track and to a distance of 45 feet on either side. The dipper, which can swing through two-thirds of a circle, has a capacity of 1¼ cubic yards, and about two dipperfuls can be handled in a minute.

Blinn "Cone Cup" Potato Masher and Fruit Press.

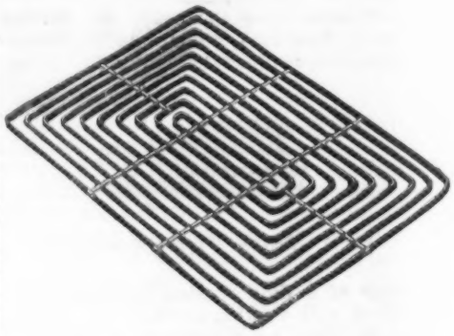
Bradley, Blinn & Lyon, 552 State street, New Haven, Conn., are introducing this article, as illustrated herewith. The handle and frame are made of a fine quality iron, and the perforated cups of heavy XXX tin. The plunger rod is attached to a slide which moves back and forth on the operating handle, which it is stated guides the plunger in and out of the cup in a perfectly straight line, making it impossible for the plunger to bind in any way. The cup is readily taken from the frame for washing separately, and the plunger hangs down so far below the frame that it is only necessary to shake or agitate in water to cleanse it. The advantages claimed for the device are that the cone-shaped cup allows much more space for the substance used to pass through; that the cone-shaped point of the plunger easily forces its way through the substance as it descends, and that it mashes potatoes, leaving them light and mealy, without beating. The points are made that the press works easily, is clean in use, is quickly cleaned, that it will not break, and that is desirable in making sauces, catsup, jams and jellies.

Blinn "Cone Cup" Potato Masher and Fruit Press.

The chairman of the Rio-Tinto Company announces that new contracts for pyrites were entered into in January for a term of three years, the price for sulphur being 3 shillings less than previous contracts. The production of copper will be about 15,000 tons greater than that of last year.

Gilcher Steel Mat.

Gilcher Steel Mat Company, 106 Canal street, Cleveland, Ohio, are introducing a mat, as illustrated herewith. It is made of upright steel wire in one continuous piece, with ferrules between the wires to space and steel rods running through the wire and ferrules, riveted at each end. The mats are galvanized after being made, thus soldering all parts where they come together. The regular sizes are 16 x 24, 18 x 30 and 22 x 36; but any size or shape can be made to order, suitable for street cars, bar rooms, hotels, &c. The point is made that the mats are durable, at the same time light, the 16 x 24 weighing 4½ pounds.



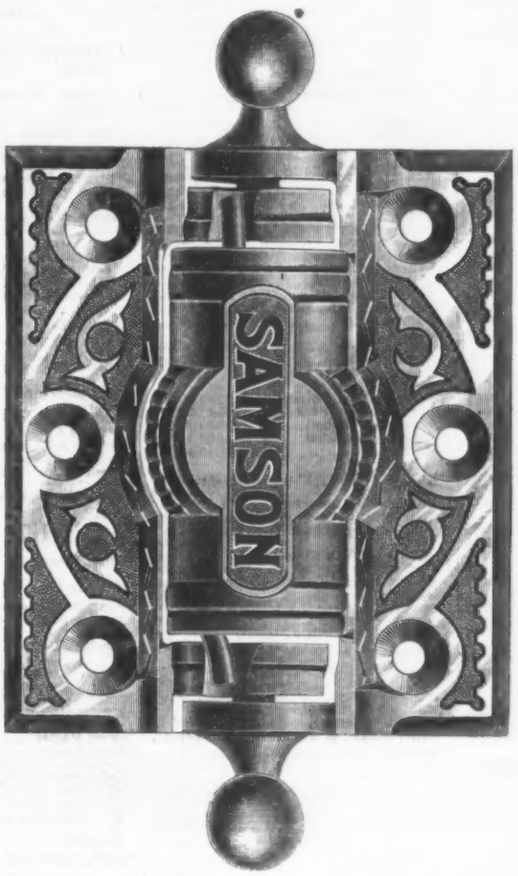
Gilcher Steel Mat.

The Knights of Labor in St. Louis have filed a complaint against the St. Louis Stamping Company, charging the latter with importing skilled labor in violation of the Contract Labor law. It was stated that the men referred to were not imported under contract, but that they came only with a verbal understanding between them and an agent of the stamping company. On the other hand it is stated that upon their arrival at New York they signed a

contract with "General" Osborne, a New York labor agency man, who was acting for the St. Louis concern. Whether the Niedringhaus Brothers can be held liable under these conditions remains to be seen. In the meantime the 15 skilled Welsh tin dippers have left the employ of the stamping company and joined the ranks of the strikers.

Samson Hold-Back Spring Hinge.

Shepard Hardware Company, Buffalo, N. Y., are putting upon the market a spring hinge, as illustrated herewith. It consists of three pieces, two leaves and one spring, the spring and castings being extra heavy and strong. Gauge lugs or markers are cast on the under side of the leaves, to hold the hinges exactly in line while being screwed in position. There is



Samson Hold-Back Spring Hinge

also a toe piece or hook on the end of the projecting spring stud, designed to keep the coil spring from slipping off. The hinge is nicely made, and is attractive in pattern and finish.

Cost of Rapid Transit in New York.

Chief Engineer Worthen's plans for rapid transit having been approved by the commissioners, and only subject to final action on the part of the Board of Aldermen, the question of cost will come into serious consideration as soon as the franchise is ready for competition. At present it is not known whether any syndicate is prepared to take hold of it. In a general way Engineer Worthen estimates the probable cost of the road at not far from $3,000,000 a mile for the main sections below Thirty-fourth street, and one-third less, or $2,000,000 a mile, for the section above Thirty-fourth street on the main line and for the east side line above Fourteenth street. The distance from the Battery to Thirty-fourth street being 3½ miles, the cost at $3,000,000 a mile would be $10,500,000, and the distance from Thirty-fourth street to the Yonkers line being 12 miles, and from Fourteenth street to Jerome Park being 10½ miles, the two upper sections, making 22½ miles, would, at $2,000,000 a mile, cost $45,000,000, making the whole cost of the 26 miles of railway, as proposed, something in the neighborhood of $55,500,000. This President Steinway is disposed to consider an outside estimate of the cost of the road as projected. He has been consulted by certain persons, the representatives of two separate foreign interests, under circumstances which led him to believe that there was at least a German and an English syndicate, neither known to the other, which were keeping their eyes on the scheme with a view to purchasing.

In its general features the Worthen plan of construction, which has been adopted, assimilates very closely to the New York arcade railway plan, excepting the pipe gallery, and with the deeper construction made necessary by the construction of the cable conduit. Melville C. Smith, who has been identified with the arcade project from the beginning, accepted the report of the commission as something of a vindication of the plans for rapid transit for New York City for which he has been contending for many years.

The Chester Foundry and Machine Company made an assignment last week and a large number of men will be thrown out of employment. The liabilities will reach $200,000, with about $100,000 assets. The assignee is J. Frank Black, one of the directors of the company.

At a meeting of the creditors of Harrison Loring, proprietor of the City Point Iron Works, Boston, the liabilities were stated to be $495,000, and the assets, on a basis of continuing the work, $563.000.

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CURRENT HARDWARE PRICES.

OCTOBER 28, 1891

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' Prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic ₩ doz $3.00, 33⅓%
Excelsior ₩ doz $10.00 50&10&2%
North's list net & 10%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.
Eagle Anvils, ₩ ℔ 10¢ 15@15&5%
Peter Wright's 11@11½¢
Armitage's Mouse Hole 10½@11¢
Armitage's Mouse Hole, Extra 12@12½¢
Trenton 10@10½¢
Wilkinson's 10½@11¢
Moore & Barnes Mfg. Co 33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00 20%
Cheney Anvil and Vise 25%
Allen Anvil and Vise, $3.00 40&10%
Star 45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—
Douglass Mfg. Co. } 70&10@70
Wm. A. Ives & Co. } &10&5%
Humphreysville Mfg. Co. }
French, Swift & Co. (F. H. Beecher, P. S. & W. Co. }
Rockford Bit Company }
Cook's, Douglass Mfg. Co. 55%
Cook's, N. H. Copper Co. 50&10@50&10&5%
Ives' Circular Lip 60%
Patent Solid Head 30%
C. E. Jenning & Co., No. 10, extension lip 40%
C. E. Jennings & Co., No. 30 60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50 20%
Lewis' Patent Single Twist 45%
Russell Jennings' Augers and Bits 25&10%
Imitation Jennings' Bits 60@60&10%
Pugh's Black 20%
Car Bits 60@60&10%
Car Bits, P. S. & W. Co. 60&10%
Snell's Car Bits 60%
L Hommodieu Car Bits 15&10%
Forstner Pat. Auger Bits 20%
Cincinnati Bell-Hangers' Bits 30&10%

Bit Stock Drills—
Morse Twist Drills 50&10&5%
Standard 50&10&5%
Cleveland 50&10&5%
Syracuse, for metal 50&10%
Syracuse, for wood (wood list) 30@30&5%
Cincinnati, for wood 30&10%
Cincinnati, for metal 45&10%

Expansive Bits—
Clarks' small, $18; large, $36 35@35&10%
Ives' No. 4, ₩ doz $60 40%
Swan's 40%
Steer's, No. 1, $26; No. 2, $22 35%
Stearns' No. 2, $48 20%

Gimlet Bits—
Common ₩ gross $2.75@$3.25
Diamond ₩ doz $1.10 25&10%
Ilee 25@25&5%
Double Cut, Shanardon's 45@45&10%
Double Cut, Ct. Valley Mfg. Co 30&10%
Double Cut, Hartwell's, ₩ gro $5.25
Double Cut, Douglass' 40&10%
Double Cut, Ives' 60@60&10%

Hollow Augers—
Ives } 33⅓ @
French, Swift & Co. } 33⅓&10%
Douglass' }
Bonney's Adjustable, ₩ doz $48 40&10%
Stearns' 20&10%
Ives' Expansive, each $4.50 50&5%
Universal Expansive, each $4.50 20%
Wood's 25@25&10%
Cincinnati Adjustable 25&10%
Cincinnati Standard 25&10%

Ship Augers and Bits—
L'Hommedieu's 15&10@15&10&5%
Watrous' 15&10@15&10&10%
Snell's 15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common ₩ gr $1.70, 45%
Awls, Should. Peg ₩ gr $2.45, 50@50&10%
Awls, Pat. Peg ₩ gr 63¢ 50@50&10%
Awls, Shouldered Brad 2.70 ₩ gr 35%
Awls, Handled Brad $7.50 ₩ gr 45%
Awls, Handled Scratch ₩ gr, $7.50 35&10%
Awls, Socket Scratch, ₩ doz, $1.50 25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality	6.00	6.50

Axle Grease—See Grease, Axle.

Axles—
No. 1, 4½@5¢, No. 2 5½¢@6½¢
Nos. 7 to 14 55&5% } 3% cash
Nos. 15 to 18 47½% }
Nos. 19 to 22 70% }
Conco rd Axles, loose collar 5¢@6¢
Conco rd Axles, solid collar 6¢@7¢
National Tubular Self-Oiling 33⅓&@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—
Spring Balances 40%

Chatillon, ₩ doz	No. 2000	20	30
	$0.80	0.95	1.75 net

Chatillon Straight Balances 40%
Chatillon Circular Balances 50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel ₩ ℔ 3½¢
Iron, Steel Points ₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '82 50&10@50&10&5%

Chatillon's No. 1 40%
Chatillon's No. 2 50%
Custer's 33⅓%

Beaters—
Egg—
Dover ₩ doz $1.50
Duplex (Standard Co.) ₩ doz $1.25
Rival (Standard Co.) ₩ doz $1.00
Duplex Extra Heavy (Standard Co.) ₩ doz $3.50
Bryant's ₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2 $36.00
Easy (H. & R. Mfg. Co.) ₩ gro $12.00
Triple (H. & R. Mfg. Co.) ₩ gro $16.50
Spiral ₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.) ₩ gro $9.00
Paine, Diehl & Co.'s ₩ gro $24.00
Silver & Co ₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2 20%

Bells—
Cow—
Common Wrought 60&10%
Western 20&10%
Western, Sargent's list 70&10%
Kentucky, "Star" 20&10%
Kentucky, Sargent's list 70&10%
Kentucky Durham 70&10
Dodge, Genuine Kentucky 70@70&10%
Texas Star 50&10@50&10&5%

Door—
Gong, Abbe's 33⅓&10%
Gong, Yankee 40&10%
Gong, Barton's 40&10@50%
Crank, Taylor's 25&10%
Crank Brooks' 50&10&2%
Crank Cone's 10%
Crank, Connel's 20&10%
Lever, Sargent's 60&10%
Lever, Taylor's Bronzed or Plated net
Lever, Taylor's Japanned 25&10%
Lever, R. E. M. Co.'s 50&10&2%
Pull, Brook's 50&10&2%

Electric,
Wollensak's 20%
Bigelow & Dowse 20%
Taylor's 20%

Hand—
Light Brass 75&10%
Extra Heavy 65&10%
White Metal 60&10&10%
Silver Chime 33⅓&10%
Globe Cone's Patent 25&10@35%

Miscellaneous—
Call 40@40&5%
Farm Bells ₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells 40%

Bellows—
Blacksmiths' 60&5@65%
Molders' 40@40&10%
Hand Bellows 40&10@50%

Belting, Rubber—
Common Standard 70@70&10&5%
Standard 70@70&5%
Extra 60@60&10%
N.Y.B.&P.Co., Carbon 60%
N.Y.B.&P.Co., Diamond 50%
N.Y.B.&P.Co., Para 40%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters 15%
Detroit Perfected Tire Bender 15%

Bits—
Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889 70&10@—%
Cleveland Block Co., Mal. Iron 50%
Moore's Novelty, Mal. Iron 50%
Sure Grip Steel Tackle Blocks 25%

Boards, Stove.
Wood Lined Crystal 50%
Oxidized 45%
Embossed 50%
Paper Lined Zinc 55%
Crystal 55%
Embossed 55%
New Tacoma 55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84 70&10&12½&2%
Genuine Eagle, Norway, list Oct., '84 80@80&10%
Phila. pattern, list Oct. 7, '84 75@75&10%
R.B.&W., old list 70%
Machine, list Jan. 1, 1890 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890 75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c. 70@70&10%
Cast Iron Shutter Bolts 70@70&10%
Cast Iron Chain (Sargent's list) 65&10%
Ives' Patent Door Bolts 60&10@60&10&5%
Wrought Barrel 70@70&10%
Wrought Square 70@70&10%
Wr't Shutter, all Iron, Stanley's 60&10%
Wr't Shutter, Brass Knob, " 40&10%
Wr't Shutter, Sargent's list 60&10%
Wr't Sunk Flush, Sargent's list 55&10%
Wr't Sunk Flush, Stanley's list 50&10%
Wr't B.K.Flush. Com'n " 55&10%

Stove and Plow—
Stove 60%
Plow 60&5%
R. B. & W., Plow 55%

Tire—
Common, list Feb. 28, '83 65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83 65%
Keystone, Philadel., list Oct. '84 80%
Norway, Phila., list Oct. '84 75%
American Screw Company:
Norway, Phil., list Oct. 16, '84 75%
Eagle, Phil., list Oct. 16, '84 80%
Philadel., list Oct. 16, '84 80%
Bay State, list Feb. 28, '83 65%
R.B.&W., Philadel., list Oct. 16, '84 80%

Borers, Tap.
Common and Ring 20&10%
Ive's Tap Borers 33⅓&5%
Enterprise Mfg. Co. 30&10@30%
Clark's 33⅓@35%

Borax ₩ ℔ 9½@10¼¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔ 2¾¢

Braces.—
American Bit Brace Co.:
Nos. 10, 13, 20 60&10%
Nos. 11, 21, 24, 27 70&10%
Nos. 22, 23, 25 60&10&5%
Nos. 13, 26, 36, 37 70&10&5%
Ball Braces, net $1.12 to $1.25
Amidon's
Barker's Imp'd Plain 75&10@80%
Barker's Imp. Nickeled 65&10@70%
Ratchet 75&10@80%
Eclipse Rachet 60%
Globe Jawed 40@40&10%
Corner Brace 40@40&10%
Universal, 8 in., $2.10; 10 in. $2.25
Buffalo Ball $1.10@$1.1
Barber's,
Nos. 10 to 16 50%
Nos. 30 to 33 50%
Nos. 40 to 63 60&10%
Saxton's,
Barker's Imp. Polished 75&10@80%
Barker's Imp. Nickeled 65&10@70%
Ratchet, Polished 50&10@60%
Ratchet, Nickeled 40&10@50%
Buffalo Ball net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30 50&10@60&5%
Nos. 117, 118, 119 70@70&5%
Common Ball, American $1.00@$1.10
Fray's Genuine Spofford's 50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty 70@70&5%
New Haven Ratchet 60&5@60&10%
Barber Ratchet 60&5@60&10%
Barbers 60&5%
Spofford 60&5@60&10%
Osgood's Ratchet 40&10@50%
P. S. & W. Co., Peck's Patent 60%

Brackets—
Shelf, plain,
Regular list 60 & 60&10%
Sargent's list 55&10@55&10&10%
Shelf, fancy,
Sargen 's list 60&10@60&10&10%
Other makes at a wide range of prices.

Bright Wire Goods—See Wire.

Broilers—

	Inch	9	10	9x11
Henis' Self-Basting.	Per doz	$4.50	5.50	6.50

New Haven 50%
Wire Goods Co 65&10%

Buckets, Well.
Galvanized—
Hill's ₩ doz, 12 qt, $4.25; 14 qt, $5.2
Iron Clad ₩ doz. 14 qt, $4.25@$4.5
Helwig's Flat Iron Band $3.75
Helwig's Wired Top ₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass 75&10@80
Cast Brass, Tiebout's 50%
Cast Brass, Fast 33⅓&10%
Cast Brass, Loose Joint 33⅓&10%

Cast Iron—
Fast Joint, Narrow 50&10&5@60%
Fast Joint, Broad 50&10@60%
Loose Joint }
Loose Joint, Japanned }
Loose Joint, Jap. with Acorns }
Parliament Butts } ..70&10
Mayer's Hinges } @75%
Loose Pin, Acorns }
Loose Pin, Acorns, Japanned }
Loose Pin, Acorns, Japanned, Plated Tips }

Wrought Steel—
Fast Joint, Narrow }
Fast Joint, Lt. Narrow }
Fast Joint, Broad }
Loose Joint, Broad } .70&10
Table Butts, Back Flaps, &c } @75%
Inside Blind, Regular }
Inside Blind, Light }
Loose Pin }
Bronzed Wrought Butts 50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt 5½@6¢
Burke's, One Prong, Blunt 5½@6¢
Burke's, Two Prong, Blunt 7½@8¢
Burke's, One Prong, Sharp 6½@7¢

Can Openers—See Openers, Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's 35@37¢
E. B. Trimmed Edge, 1-10's 47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's 47@50¢
Musket Waterproof, 1-10's 50@53¢
G. D. 27@30¢
S. B. Genuine Imported 45¢
Eley's E. B. 56¢ @ 58¢
Eley's D Waterproof, Central Fire $1.00

Primers—
Berdan Primers, $1.00 2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20 2%

Cards—List January 28, 1891.
Watson's Cotton, Wool, Horse and File 25%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers, Carpet.

Cartridges—
Rim Fire Cartridges 50&5&2%
Rim Fire Military 15&2%
Cent. Fire, Pistol and Rifle 25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% above discounts.
Blank Cartridges, 22 cal., $1.75 2%
Blank Cartridges, 32 cal., $3.50 2%
Primed Shells and Bullets 15&5&2%
B. B. Caps, Round Ball, $1.75 2%
B. B. Caps, Con. Ball, Swgd., $2.00 2%

Casters—
Bed } Brass 55@55&10%
Plate } Others 60@60&10%
Shallow Socket }
Deep Socket 40&10%
Yale Casters, list May, 1884 30&10@40%
Yale, Gem 60@60&5%
Martin's Patent (Phœnix) 45&10@50%
Payson's Anti-friction 60@60&10%
Giant Truck Casters 30%
Stationary Truck Casters 50&10%
Socket Truck Casters 50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic 5 ℔ pails ₩ ℔ 5¢

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890 60@60&5%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½¢@1¢ ₩ ℔.
German Coil, list Oct. 6, 1890 60@60&5%
German Halter Chain, list Oct. 6, 1890 60@60&5%
Covert Halter 60&2%
Covert Traces 35@2%
Covert Heel Chain 60@5%
Oneida Halter Chain 60@50&5%
Galvanized Pump Chain ₩ ℔ 5½@6¢
Jack Chain, Iron 75&10@80%
Jack Chain, Brass 75@75&10%

Chalk—
White, case lots ₩ gr 50¢; small lots 55 @56¢
Red, case lots ₩ gr 67¢; small lots 77 @78¢
Blue, case lots ₩ gr 75¢; small lots 86¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W } ..75 @ 75&10%
New Haven }
Witherby }
Mix }
Ohio Tool Co. }
Douglass 75@75&5%
Buck Bros. 30%
Merrill 60&10@60&10&5%
L. & I. J. White 30@30&5%
Tanged and Miscellaneous.
Tanged Firmers 40&10@50%
Butchers' $4.75@$5.00
Spear & Jackson's $5 to $
Buck Bros. 30%
Cold Chisels, ₩ ℔ 15&10%

Chucks—
Beach Pat. each, $8.00 30%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury each, $6.00, 30@30&5%
Syracuse, Bals Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks,
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks, 40%
Drill Chucks 15%
Union Mfg. Co.,
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns.
Tilton Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2.60; 10 gal., $3.75; 15 gal. $3.00; 20 gal., $3.25.

Clamps—
B. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.
Butchers'.
Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
and grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5½¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.
Hardware list.....o o&2%

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.
Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.
Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%
Kellogg's.....50&10
Sweet & Clark's.....50&10

Compasses, Dividers, &c.—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—
Sash.
Common.....₩ lb, 10¢ @ 11¢
Patent, good quality.....₩ lb, 12 @ 12¢
White Cotton Braided, fair. ₩ lb, 24¢@25¢
Common Russia Sash.....₩ lb, 13¼@13¢
Patent Russia Sash.....₩ lb, 14¢
Cable Laid Italian Sash.....₩ lb, 21@22¢
India Cable Laid Sash.....₩ lb, 12¢
Silver Lake—
A Quality, White, 50¢.....25 %
A Quality, Drab, 55¢.....25 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring Extra Braided White.34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....26¢
Massachusetts, White.....26¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢..30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White...₩ lb, 28¢
Wire Picture.
Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50&5&2@50&10&2%

Crayons.
White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain

Cutters—
Meat.
Dixon's ₩ doz.....40&5%
Nos.... 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's ₩ doz.....40&5%
Nos.... 100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos.... 11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos.... 1 2 3 4 5
Each....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.... 10 12 22 32 42
Each....$3 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos.... 112 116 118 120 122
Each....$2.00 $2.75 $3.00 $2.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos.... 1 2 3
$22.00 $30.00 $40.00
Home No. .....₩ doz $26.00, 55&10%
Draw Cut, each:
Nos..5 2 6 8
$50 $75 $80 $225.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00
Tobacco.
Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%
Washer.
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's. ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....35&10%

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—
Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50¢
Imperial, ₩ doz $15.....45%

Dividers—
See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.
Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Milliers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@30&5%
Ratchet, Ingersoll s.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $15.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%

Drill Bits or Bit Stock Drills—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.
Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
P. S. & W.....70 %
Knapp & Cowles:
No. 1.....60&20@70%
No. 2.....60&10@10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50& 5&50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30@30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—

	No. 4 to 40 gr.	No. 54 to 150 gr.	Flour, CF F. FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4½¢	5½¢	2½¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.
List No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—
Mackrell's, ₩ dos. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new lis.
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key..50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined...60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots.....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ dos $50.00.....20&10%
Lane's, ₩ dos $36.00.....25&10%
Victor, ₩ dos $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—
Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....60&10@60&10&5%
Eagle.....60&10&5@60&10&10%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1 1883, 15%
Butcher.....Butcher's ist, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.
Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—
Hay, Manure, &c., Asso List.65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—
Saw—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%
Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons.. 33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland.....40@40&5%

Freezers, Ice Cream—
White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&2&5
Shepard's Lightning.....65@65&2&5
Gem.....60%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10&10%
Boss and Pet.....6C&10&10&10%
Keystone, P. D. & Co., each $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.
Gersdorff's Perfection, Standard and Globe; 7in, 1 gro., 10 %; 8 to 6 gro., 20 %; 5 to 10 gro.....30 %
Copper, 1 to 6 doz., 15 %; 6 to 12 doz., 20 %; over 12 doz.....25 %

Furnaces, Soldering.
Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 8.50

Fuse—Dis. 12½%. ₩ 1000
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 2.85
Double Taped Fuse, for very wet gr. 4.25
Triple Taped Fuse, for very wet gr.. 5.00
Small Gutta Percha Fuse, for water. 7.00
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—
Stebbin's Pattern.....80@80 &5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....60&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....30&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.
Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Lower grades, special brands. ₩ gr $5.50@$7.00

Grindstones—
Small, at factory.....₩ ton $7.50@9.00
Family, Cleveland Stone Co.....20 %

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts, Awl.
Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00.45&10%

Halters.
Covert's, Rope, Jute.....6)&10&10&2½
Covert's, Rope, 7-16-in., Jute.....70&2½
Covert's, Rope, ½-in. Hemp.....50&2½
Covert's Adj. Rope Halters.....40&2½
Covert's Hemp Horse and Cattle Tie. 50&2½
Covert's Jute Horse Ties.....70&2½
Covert's Jute Cattle Ties.....70&10&2½
Covert's Adj. Web Halters.....35&5&2½

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co. / Humason & Beckley / Atha Tool Co. / Verree.....50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail....40&12½%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Hartford, Nail Hammers.....40&2½
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@2½
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 lb and under.....₩ lb 40¢ / 3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢ /
Wilkinson's Smiths.....10½¢@11½¢

Handcuffs and Leg Irons—See Police Goods,

Handles—
Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₩ pair, 28¢; No. 3 13¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢.....6
Champion.....18¢
Iron, Wrought or Cast—
Door or Thumb.

Nos.....	0	1	2	3	4
Per doz....	$0.90	1.00	1.10	1.35	1.50

60&10&10%
Boggin's Latches.....₩ doz 30¢@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.32 Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%
Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd...₩ gr 8.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
I. S. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 7 75
Auger, assorted.....₩ gr 5.00.....50%
Auger, large.....₩ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1 25
Pat. Auger, Swan's.....₩ set $1 00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ dos pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft, 10¢.....50&15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00.....20%
Eclipse.....20&10%
Felix, ₩ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Lane's Parlor.....40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co. Blood's, Hunt's, Hurd's, Mann's, Peck's, Underhill's.....40 & 10 @ 50&5 %
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son.
Kelly's
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10@2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₩ dos $4.40, 60%
N. E.....₩ dos $7.00, 55%
N. E. Reversible.....₩ dos $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ dos $5.00, 55&10%
Automatic.....₩ dos $12.50, 50%
Common Sense.....₩ dos pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₩ dos $12.00, 50%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March [illegible].....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Bisarn's.....50&10%
Niagara, Boldback pattern, per gross.....$14.00

Wrought Iron Hinges
List February 14, 1891.
Strap and T.....60&10%
Corrugated Strap and T.....50 & 10 %
Screw Hook and Strap..... 6 to 12 in., ₩ D. 4¢; 14 to 20 in., ₩ D. 3½¢; 22 to 36 in., ₩ D. 3¢
Screw Hook and Eye.... ⅜ in., ₩ D 7½¢; ½ in., ₩ D 5½¢; ⅝ in., ₩ D 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "S, 10 & 12 in., ₩ D.....5¢ "Providence" over 12 in., ₩ D.....4¢

Hoes—

Eye—

D. & H. Scovill.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. / Am. Axe and Tool Co., S. & O. Pat. 50&10&5 @60%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton &c.....70%
Warren Hoe.....60%
Magic.....₩ dos $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ dos $18.....60%

Bit.

Extension, Barber's, ₩ dos $15.00.....40@40&10% Ives, ₩ dos $20.00.....60&5@60&10% Diagonal.....₩ dos $24.00, 40% Angular.....₩ dos $24.00, 40&5%

File and Tool—

Bals Pat.....₩ dos $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list..... / Bird Cage, Reading..... / Clothes Line, Sargent's list.. / Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₩ dos $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80@80&10%
Atlas, Coat and Hat.....60%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ dos $2.25
Bush.....55@60%
Whiffletree—Patent.....50%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....40&10 @ 60%

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 ℔, $2.30@$2.40
Self-Heating.....₩ dos $9.00 net
Self-Heating, Tailors'....₩ dos $18.00 net
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron.....50&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₩ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₩ dos, $15.00.....15%
Fox Reversible, Self-Fluter ₩ dos $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓ %
National Self-Heating.....30 %

Soldering—

Soldering Coppers.....₩ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per dos., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....40%
Victor.....40%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ dos $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AAA1, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₩ dos $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.. $2.00
Corn Auburn Mfg. Co. Crescent....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Drawing—

Witherby, P. S. & W., Mix, New Haven.....75@75&10%
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & L. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00 @ $9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₩ dos $11.00@$11.50
Heath's.....₩ dos $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₩ dos.$7.00 @ $8.00

Mincing.

Am. (3d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ dos, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₩ dos $3.00 25%
Buffalo Double Adj'table. ₩ dos $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture, Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Sticking, &c..40%

Ladles.—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₩ dos $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ dos.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards.....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular..... ₩ dos $3.60
3-inch Bull's-eye Police regular..... ₩ dos $3.90
2¾-inch Bull's-eye Police flash light.... ₩ dos $4.00
3-inch Bull's-eye Police flash light..... ₩ dos $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2 %
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; No. 5, $3.....10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 18 19 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ dos $7.50, 20%

Links, Open.

Terry's—per gro.:

Nos.	1	2	3	4
	$6 00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... / List March, '84, rev. Jan. 1, '85..33⅓&2%
Deits, Nos. 36 to 39.....40%
Deits, Nos. 51 to 63.....40&10%
Deits, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....35%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar.20, 1889. / Mallory, Wheeler & Co., list July, '88. / Sargent & Co., list Aug. 1, '88 / Reading Hardware Co., list Feb. 2, '88, ... 65&10@70% Much lower net prices often made.
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delta Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list....70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 506..15%
A. E. Deits.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₩ dos, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian. Nos. 119, 120, 130 and 140.....90&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 1010 line.....35&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr..33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Weiker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....60%&10@60%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Standard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Lieseche's, No. 100, ₩ gr $8; 105, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%
Buckeye.....₩ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ dos, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	.....50%
Snell's, Nice's Pat.	5.50	6.75	.40&10&10%
Jennings	5.50	6.75	.45@45&10%
Other Machines	2.25	2.75	.....
Phillips' Patent with Augers	7.00	7.50	.....
Miller's Falls	7.50	.....	.25%

Fluting.

Knox, 4½-inch Rolls.....$3.25 each / Knox, 6-inch Rolls.....$3.60 each 35%
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $4.50 each.....35%
Crown Jewel 6 in.....$3.50 each. 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₩ dos $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₩ dos 15 90 .....40%
Shepard Hand Fluter, No. 110 ₩ dos $11.00.....40%
Shepard Hand Fluter, No. 95 ₩ dos $8.00.....40%
Clark's Hand Fluter, ₩ dos $15.00.....35%
Combined Fluter and Sad Iron, ₩ dos $15.00.....30%
Buffalo ₩ dos $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.....30%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%
Sure Grip Steel Tackle Blocks.....25%

Washing—

Anthony Wayne, ₩ dos No. 1, $51 No. 2, $45; No. 3, $42
Western Star ₩ dos No. 2, $45; No. 3, $48

Mallets.
Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. ..... 30@30&10%

Mattocks. Regular list. ..... 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4: ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz. $2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888. 60&10@—%
American, Enterprise Mfg Co. 20&10@30%
The Swift, Lane Bros. ..... 20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.
Pennsylvania. New Model, Excelsior, Continental, &c. ..... 60@60&5%
Philadelphia. ..... 60&10%
Perfection ..... 60&10&10%
Easy ..... 60&10@60&10&5%
Bay State ..... 60&10@60&10&—%
Other Machines. ..... 60&10&5@70%

Muzzles—
Safety ..... ₱ doz, $3.00, 25%

Nails,
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75&10@80%
Tack Mfrs.' list. ..... 70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base. ..... $2.10 @ $2.20

Horse—

	Nos. 6	7	8	9	10
Ausable. ...	28¢	26¢	25¢	24¢	23¢.
	40&5&5&2%				
Clinton, Pin..	19¢	17¢	16¢	15¢	14¢ 30%
Essex.	28¢	26¢	25¢	24¢	23¢.
	40&5&5&2%				
Lyra.	19¢	17¢	16¢	15¢	14¢ 30%
Snowden	19¢	17¢	16¢	15¢	14¢ 30%
Putnam	23¢	21¢	20¢	19¢	18¢.
	1000 ℔ in year 15%				
Vulcan	23¢	21¢	20¢	19¢	18¢. 12½&2½%
Northwest'n.	25¢	23¢	22¢	21¢	20¢.
	25@25&5%				
Globe	23¢	21¢	20¢	19¢	18¢.
	20&5&5%				
Boston	23¢	21¢	20¢	19¢	18¢.
	20&5&5%				
A. C.	25¢	23¢	22¢	21¢	21¢.
	25&10@33⅓&5%				
C. B.-K.	25¢	23¢	22¢	21¢	21¢.
	25&10@33⅓&5%				
Maud S.	25¢	23¢	22¢	21¢	21¢.
	40&10%				
Champlain ..	28¢	26¢	25¢	24¢	23¢.
	25&1C&10%				
Saranac.	23¢	21¢	20¢	19¢	18¢. 30&10%
Champion	25¢	23¢	22¢	21¢	20¢.
	10&10&10%				
Capewell.	28¢	26¢	5¢	24¢	23¢.
	35&5@35&10%				
Star.	23¢	21¢	·¢	19¢	18¢.
	10&10@10&12½%				
Anchor.	23¢	21¢	20¢	19¢	18¢ 35%
Western.	23¢	21¢	20¢	19¢	18¢. 40&10%
Empire Bronsed.					14 ₱ ℔.

Picture—
Brass Head, Sargent's list. ..... 50&10&10%
Brass Head, Combination list. ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 13, 1889.

	Square.	Hex.
Hot Pressed.	5.35¢	5.95¢ off list.
Cold Punched.	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₱ ℔. net; in packages less than 100 ℔, add ½¢ ₱ ℔, net.

Oakum—
Best or Government. ..... ₱ ℔ 7@7½¢
U. S. Navy. ..... ₱ ℔ 6¢@6½¢
Navy. ..... ₱ ℔ 5½¢@6¢

Oilers
Zinc and Tin ..... 65&10@70%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass. 50%
Olmstead's Tin and Zinc. 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc. 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₱ gro. $2
Steel, Draper and Williams. 50%

Openers, Can.
Messenger's Comet. ..... ₱ doz $3.00, 25%
American. ..... ₱ gross $3.00
Duplex. ..... doz 25¢, 15@20%
Lyman's. ..... ₱ doz $3.75, 20%
No. 4 French. ..... ₱ doz $2.25, 55@60%
No. 5, Iron Handle. ..... ₱ gr $6.00, 45@50%
Eureka. ..... ₱ doz $2.50, 10%
Sardine Scissors. ..... ₱ doz $2.75@3.00
Star. ..... ₱ doz $2.75
Sprague, No. 1, $3.00 2, $2.25; 3, $2.50. 50&10&10%
Excelsior No. 1 $2.50: No. 2, $1.50. ...40%
World's Best, ₱ gross, No. 1, $12.00. No. 2, $24.00; No. 3, $36.00. ..... 50&10%
Universal, ₱ doz $3.00. ..... 45&5%
Domestic, ₱ doz $2.50. ..... 45%
Champion ₱ doz $2.00. ..... 50%

Packing, Steam—
Rubber—
Standard. ..... 60&5@65%
Extra ..... 50@50&5%
N. Y. B. & P. Co., Standard. 50%
N. Y. B. & P. Co., Empire. 60%
N. Y. B. & P. Co., Salamander. 25%
Jenkins' Standard. ₱ ℔ 80¢. ... 25@25&5%
Miscellaneous—
American Packing. ..... 10¢@11¢ ₱ ℔
Russia Packing ..... 14¢ ₱ ℔
Italian Packing ..... 13¢@14¢ ₱ ℔
Cotton Packing ..... 15¢@17¢ ₱ ℔
Jute. ..... 7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.
Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75	
Helwig's.	2.50	2.75	3.00	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets.	2.75	3.35	3.50	

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt. ..... ₱ doz $5.40
Stable and Milk, 14 qt. ..... ₱ doz $6.00
Fire Pails, deep. ..... ₱ doz $5.40
" " round bottom. .... ₱ doz $7.80
Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails.	6.00	6.50
Horse Pails.	5.00	
Buggy Pails.	4.00	
Slop Jars (bal. trap).	8.00	9.00
Chamber Pails, 14-qt.	6.50	7.50

Pans.
Dripping.
Smalls izes. ..... ₱ ℔ 6½¢
Large sizes. ..... ₱ ℔ 5½¢
Silver & Co. (Covered). 40%
Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.		5	6	7	8
₱ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods. ..... 75&@75&10%
Acme Fry Pans ..... 60&10%
Dust—
Steel Edge, No. 1. ..... ₱ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886. ..... 50@50&10%
Sibley's Emery and Crocus Cloth. 30%

Parers.
Apple.
Advance. ..... ₱ doz $4.75
Baldwin. ..... ₱ doz 5.25
Bonanza. ..... each 5.00
Daisy. ..... ₱ doz 4.00
Dandy. ..... each 7.50
Eclipse. ..... ₱ doz 4.25
Eureka, 1888. ..... each 16.00
Family Bay State. ..... ₱ doz 12.00
Favorite ..... ₱ doz 5.00
Gold Medal. ..... ₱ doz 4.00
Ideal. ..... ₱ doz 4.00
Improved Bay State. ₱ doz $7.00 @ $9.00
Little Star. ..... ₱ doz 4.50
Monarch. ..... ₱ doz 13.50
New Lightning. ..... ₱ doz 5.50
Oriole. ..... ₱ doz 4.00
Penn. ..... ₱ doz 4.00
Perfection. ..... ₱ doz 4.00
Pomona. ..... ₱ doz 4.00
Rocking Table. ..... ₱ doz 6.00
Turn Table. ..... ₱ doz 4.50
Victor. ..... ₱ doz 13.50
Waverly. ..... ₱ doz 4.00
White Mountain. ..... ₱ doz 4.00
72. ..... ₱ doz 4.25
78. ..... ₱ doz. 7.00
Potato—
White Mountain ..... ₱ doz $4.50
Antrim Combination. ..... ₱ doz $5.50
Hoosier ..... ₱ doz $13.50
Saratoga. ..... ₱ doz $5.50

Pencils—
Faber's Carpenters'. ..... high list 50%
Faber's Round Glit. ..... ₱ gro $5.25
Dixon's Lead. ..... ₱ gro $4.50
Dixon's Lumber. ..... ₱ gro $6.75
Dixon's Carpenters' 10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00. ..... 60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Box—
Humason, Beckley & Co.'s. ..... 60&10%
Sargent & Co's. ....$17 and $18. ..... 60&10%
Peck, Stow & W Co. .. 50&10@50&10&5%
Curtain—
Silvered Glass. ..... net
White Enamel. ..... net
Escutcheon,
Iron, list Nov. 11, 1885. ..50&10@50&10&5%
Brass. ..... 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 57½%
1¼ and under, Galvanized 47½%
1¼ and over, Plain. 67½%
1¼ and over, Galvanized. 55%
Boiler Tubes,
Sizes up to 2¾ in. inclusive. 55%
Sizes 3 to 6 in. inclusive. 65%
Sizes 7 in. and up. 65%
Casing. 55%
Steel Boiler Tubes. 30%

Planes and Plane Irons—
Wood Planes—
Molding. ..... 40&10%
Bench, First Quality. ..... 50&10%
Bench, Second Quality. ..... 55&10%
Bailey's (Stanley R. & L. Co.). .. 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.). ..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). ..... 20&10@20&10&10%
Steer's Iron Planes. ..... 35@35&10%
Merrien Mal. Iron Co.'s. ..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co. ..... 50@50&10%
Gage Tool Co.'s Self-Setting. ..20&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 20&10@20&10&10%
Standard Tool Co. ..... 50@50&5%
Plane Irons—
Butcher's. ..... $5.00@$5.25 to 2
Buck Bros 30%
Auburn "Thistle." ..... } 30&10%
Ohio. ..... }
Sandusky. 30%
S. & I. J. White. 35%

Plates.
Felloe ..... ₱ ℔ 6¢@6½¢

Pliers and Nippers—
Button's Patent. ..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ..... 20&10@33⅓%
Humason & Beckley Mfg. Co. .50@50&10%
Lindsay's Giant. 40%
Gas Pliers. 60%
Gas Pliers, Custar's Nickel Plated. .60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel. 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters. 20%
Morrill's Parallel, ₱ doz, $12.00. ...30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List ..... 70&10@70&10&10%
Disston's. 50%
Pocket Levels. ..... 70&10@70&10&10%
Davis Iron Levels. 30%
Davis' Inclinometers ..... 10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00. ..... 25%
Silver & Co., 6-Ring. ₱ doz $4; 8-Ring $2

Pokes, Animal—
Bishop's I. X. L. ..... ₱ doz $6.00
Bishop's O. K. ..... ₱ doz $5.25
Bishop's Pioneer. ..... ₱ doz $3.75
Bishop's American. ..... ₱ doz $2.75
Eagle, Double Stale. ..... ₱ doz $5.75
Eagle, Single Stale. ..... ₱ doz $3.75
Buckeye, Single Stale. ..... ₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's. 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00. ..... 25%
J. P. Lovell's Police Goods. 25%

Polish, Metal.
Prestoline. 30%
Prestotine Paste. 33⅓%
Gaston's Silver Compound. 33⅓%

Polish, Stove.
Joseph Dixon's. ..... ₱ gro $6.00, 10%
Gem. ..... ₱ gro $4.50, 10%
Gold Medal. ..... ₱ gro $6.00, 25%
Mirror ..... ₱ pro $6.00, —%
Lustro. ..... ₱ gro $4.75
Ruby. ..... ₱ gro $3.75
Rising Sun, 5 gro lots ..... ₱ gro $5.50
Dixon's Plumbago. ..... ₱ ℔ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel. ₱ gro
Yates' Liquid, 2 3 5 10 gal....
₱ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 12½¢
Jet Black ..... ₱ gro $3.50
Japanese. ..... ₱ gro $5.50
Fireside. ..... ₱ gro $2.50
Diamond O. K. Enamel. ..... ₱ gro $19.00
Bonnell's Liquid Stove Polish. ₱ gro $9.00
Bonnell's Paste Stove Polish. ₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 12½¢
Nickel Plate Paste ..... ₱ gro $6.00
Crown Paste ..... ₱ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₱ ℔ 12¢
Black Flag. ..... ₱ gross, $7.20
Black Flag, 5 and 10 ℔ pails. .... ₱ ℔ 12¢
Black Flag, liquid, in bottles, ₱ gro. .$8.00

Poppers, Corn—
Round or Square, 1 qt. .₱ gr $10.00@10.50
Round or Square, 1½ qt. ₱ gr $15@15.50
Round or Square, 2 qt. .₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned. ..... 40&10@40&10&5%
Enameled. ..... 40&10@40&10&5%
Family, Howe's "Eureka." 40%
Family, L. F. C.'s "Handy" 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20&10@30%
Henis. ..... ₱ doz $3.50
Shepard's ... n City 40%
Silver & Co. ..... ₱ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton ..... ₱ doz $18.00, 33⅓%
Curtiss Hammer. ..... ₱ doz $9.00
Giant, No. 1. ..... ₱ doz, $13.00, 10%
Giant, No. 2. ..... ₱ doz, $15.00, 10%
Pelican. ..... ₱ doz, $9.00, 25%
Eclipse. ..... each, $2.00 net

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw. ..... 60&10%
Brass Screw. ..... 60&10%
Japanned Side. ..... 60%&10%
Japanned Clothes Line. ..... 60&10%
Empire Sash Pulley. ..... 55@60%
Moore's Sash, Anti-Friction. 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50. ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "P" Common and Pat. Bushed 30%
Hay Fork, Tarbox Pat. Iron. 20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks. ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00. ..... 40%

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers. ....67½@70%
Pitcher Spout, Cheaper G'ds. .75@75&10%

Punches—
Saddlers' or Drive, good, ₱ doz. ..60@65%
Bemis & Call Co.'s Cast Steel Drive. .50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality. ... ₱ doz $2.50@2.60
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check .. 40%
Solid Tinners', P. S. & W. Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20@25%
Rice Hand 2 unches 15%
Avery's Revolving. 40%
Avery's Saw-Set and Punch. See Saw Sets

Rail—
Sliding Door, Wr't Brass, ₱ ℔ 35¢. 15%
Sliding Door, Bronzed Wr't Iron. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light, in. ½ ¾ ¾
Per 100 feet. $2.00 2.50 3.10 10%

B. D. for N. E. Hangers—

	Small.	Med.	Large.	
Per 100 feet.	$2.15	2.70	3.25	net
Terry's Steel Rail, ₱ foot.				4½¢
Victor Track Rail, 7¢ ₱ foot.				50&2%
Carrier Steel Rail, ₱ foot.				4½¢
Moore's Wrought Iron.				25%

Rakes—
Cast Steel, Association goods. ..66⅔@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable. ..... 70@70&5%
Gibbs Lawn Rake. ..... $12.00, 50&15%
Canton Lawn Rake. ..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless. 30%
Fort Madison Steel Tooth Lawn Rake. $6.00. ..... 25%

Razors—
J. R. Torrey Razor Co. 20%
Wostenholme and Butcher, $10.00 to £. 10%
Jordan's AAAI, new list. ..... net
Jordan's Old Faithful, new list. ..... net
Galvanic. ..... ₱ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co. 55%
Sargent's. ..... 60⅔&10@70&5%
Hotchkiss' low list. 30%
Humason, Beckley & Co.'s. ..... 70&10%
Peck, Stow & W. Co's. .50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers. ..... ₱ doz $2.00
Top of the Hill Rings. ..... ₱ doz $1.25
Hill's Improved Ringers. ..... ₱ doz $1.25
Hill's Old Style Ringers. ..... ₱ doz $1.12½
Hill's Tongs. ..... ₱ doz $3.00
Hill's Rings. ..... ₱ doz bxs $1.00
Perfect Rings. ..... ₱ doz bxs $1.50
Perfect Ringers. ..... ₱ doz $2.15@$2.25
Blair's Hog Ringers. ..... ₱ doz $2.00
Blair's Hog Rings. ..... ₱ doz 99¢@$1.00
Champion Ringers. ..... ₱ doz $2.00
Champion Rings, Double. ..... ₱ doz $2.25
Brown's Ringers. ..... ₱ doz $2.00
Brown's Rings. ..... ₱ doz $1.15@1.25
Electric Hog Rings. ... ₱ doz boxes $1.50
Electric Hog Ringers ..... ₱ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87. ..... 40%
Copper. ..... 60@60&10%
Coppered Iron, Bertina Brand. 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass ..... 25&2%
Stair, Black Walnut ..... ₱ doz 40¢

Rollers—
Barn Door, Sargent's list. ..... 60&10&10%
Acme Moore's Anti-Friction. 55%
Union Barn Door Roller 70%

Rope.
Manila. ..½ in. and larger ..... ₱ ℔ 10½¢
Manila. ..... ⅜ in. ₱ ℔ 10½¢
Manila. ..... ¼ and 5-16 in. ₱ ℔ 11½¢
Manila Tarred Rope. ..... ₱ ℔ 9½¢
Manila, Hay Rope. ..... ₱ ℔ 10½¢
Sisal. ..... ½ inch and larger ₱ ℔ 6¾¢
Sisal. ..... ⅜ in. ₱ ℔ 7½¢
Sisal. ..... ¼ and 5-16 in. ₱ ℔ 7¾¢
Sisal, Hay Rope. ..... ₱ ℔ 6½¢
Sisal, Tarred Rope. ..... ₱ ℔ 6½¢
Sisal, Medium Lathe Yarn. ..... ₱ ℔ 5½¢
New Zealand. ..½ in. and larger ₱ ℔ 6½¢
New Zealand. ..... ⅜ inch, ₱ ℔ 6¾¢
New Zealand. ¼ and 5-16 inch, ₱ ℔ 7½¢
New Zealand, Hay Rope. .... ₱ ℔ 6½¢
New Zealand, Tarred Rope. ... ₱ ℔ 5½¢
Note.—Manufacturers' prices on above ½¢ ₱ ℔ less, f.o.b. factory.
Cotton Rope. ..... ₱ ℔ 18½@16¢
Jute Rope. ..... ₱ ℔ 6 @6½¢
Wire—
List May 1, 1886.
Iron. ..... 32½&2½%
Iron, Galvanized. ..... 40&2½%
Cast Steel. ..... 40&2½%

Rules—
Boxwood. .....30&10&10@30&10&10&10%
Ivory. ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel. ..... 25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—The following prices are often cut by jobbers.
Disston's Circular ..... 45@45&5%
Disston's Cross Cuts ..... 45@45&5%
Disston's Hand ..... 20@20&5%
Woodrough & McParlin.
Hand, Panel and Rip ..... 25@25&5%
Narrow Champion Cross Cuts with Handles, ₱ foot. ..... 18@20¢
Champion Thin Back Cross Cuts ₱ foot. ..... 2 @ 2½¢
Champion Extra Thin Back Cross Cuts, ₱ foot. ..... 29@31¢
One Man Champion Cross Cuts ₱ foot. ..... 37@40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip. ..... 3¢@3½&5%
Narrow Champion Cross Cuts with Handles, ₱ foot. ..... 18@20¢
Champion Thin Back Cross Cuts. ₱ foot. ..... 26@28¢
Champion Extra Thin Back Cross Cuts. ₱ foot. ..... 29@31¢
One Man Champion Cross Cuts, ₱ ft 37@40
Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 32¢
Atkins' Champion and Electric Tooth X Cuts. ..... ₱ foot 30¢
Atkins' Hollow Back X Cuts. .₱ foot 20¢
Atkins' Mulay, Mill and Drag. 40%
Atkins' One-Man Saw, with handles, ₱ foot 40¢
Peace Circular and Mill. ..... 45@45&5%
Peace Hand Panel and Rip. ....2¢@3¢&5%
Peace Cross Cuts. ..... 45@45&5%
Richardson's Circular and Mill. 45@45&5%
Richardson's X Cuts. ..... 45@45&5%
Richardson's Hand, &c. ..... 2¢@25&5%
C. E. Jennings & Co., Hand, Panel and Rip ..... 2¢@25&10%

Hack Saws—

Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—

Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cab. Makers' $15.25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....80@30&10%
Richie Bros.' Platform.....40%

Scale Beams—See Beams, Scale.

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $2.50.....30&10%
Box, 1 Handle.....₩ doz $4.00, 10%
Box, 2 Handle.....₩ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common .....₩ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood .....25&10@25&10&5%
Hand, Grand Rapids, list.....5%
Lag, Blunt Point, list Jan. 1, 1890..75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75@75&10%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, R. & F. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent's..60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Machine—

Flat Head, Iron.....55%
Round Head, Iron.....60%

Wood—

List January 1, 1891.

Flat Head Iron	72½%	Extra 10 @ 10&5 % of- ten given.
Round Head Iron	67½%	
Flat Head Brass	72½%	
Round Head Brass	65 %	
Flat Head Bronze	72½%	
Round Head Bronze	65 %	
Rogers' Drive Screws	83½%	

Scroll Saws—See Saws, Scroll.

Scythes.

Grain.....40&5@40&10%
Grass.....40&10@50%

Scythe Snaths—See Snaths, Scythe Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....35@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12, 2, $18.....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—

Square.....₩ gr., $4 00@$4.25
Round.....₩ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₩ gr.,$12, 20%

Rivet,

Regular list.....50&10%

Saw—

Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Imita.....₩ doz $3.25@5.25, 40&5@40&10%
Common Lever .....₩ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's. .No. 0, $8 00; No. 1, $15, 15@20%
Nash's .....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine.....$18.00, 50&10@50%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star.....25%
Leopold.....40&10@50%
Atkin's Lever.....₩ doz No. 1, $6.00
Atkin's Criterion.....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Chieftain Co.'s Superior.....₩ doz $7.00
Chieftain Co.'s Royal.....₩ doz $7.50
Crescent.....₩ doz $8.00

Sharpeners, Knife.

Parkins.
Applewood Handles....₩ doz $6.00, 40%
Rosewood or Cocobolo. ₩ doz $900 40%

Shaves, Spoke

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's, ₩ doz $9.00.....25%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers:
First quality .....80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Davenport Cutlery Co.....60@60&10%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic, 3¼ to 9 in, ₩ dos, $1.00 ₩ inch

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw.....₩ dos $18.00, 20&10%
Disston's Pruning Hook, ₩ dos $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₩ dos $3.75@4.00
Henry's Pruning Shears, ₩ dos $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ dos $12.00, 20%
Dunlap's Saw and Chisel, ₩ dos $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co.....60%

Tinners', &c.—

Shears and Snips (P. S. & W.).....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 15, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 15, 1885.....60&2%
Moore's Anti-Friction.....60%

Sliding Shutter—

R. & E., list Dec. 15, 1885 .....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....50&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality .....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—

Standard List, July 19, 1890..40&10&10%

Ship Tools—

L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix and Bryden's Shoes, at factory. $4.00
Bryden's Frog Pressure, at factory.$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox, Wrought—

Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-℔ bag	$1.42	$1.47
Drop, no to B, 5-℔ bag	.35	.36
Drop, B and larger, 25-₩ bag	1.67	1.72
Drop, B and larger 5-℔ bag	.40	.41
Buck and Chilled, 25-℔ bag	1.67	1.72
Buck and Chilled, 5-℔ bag	.40	.41
Dust Shot, 25-℔ bag	2.00	2.05
Dust Shot, 5-℔ bag	.45	.46

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)..30&10&40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—

Iron Head.....50&10@60&10&5%
Brass Head.....60&10&10%

Sieves—

Mann's Tin Rim.....50&25%
Buffalo Metallic, S. & C. Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₩ dos $2.00; ₩ gr $21.60
Electric.....₩ gr $21.00
A. & W. Sifters.....₩ dos 2.00
Hunter's.....₩ dos $2.00
Smith's Adjustable Sifters ...₩ dos $2.00
Smith's Adjustable Milk Strainer. ₩ dos $2.00
Smith's Adjustable T. & C. Strainer. ₩ dos. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ doz..	80¢	$1.00
Mesh 20, Nested, ₩ doz..	95¢	1.10
Mesh 24, Nested, ₩ doz..	$1.15	1.25

Skeins, Thimble—

Western list.....75&5@75&10%
Columbus Wrt. Steel. .Special net prices
Coldbrookdale Iron Co.....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Slates—

School, by case.....50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%

Snaths, Scythe.

List.....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co... .....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bro.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal.....50, 10&5%
18% Rogers' German Silver.....60&5%
22% Rogers' Nickel Silver. .....50&5%
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891.....60½&5 % cash
Boardman's Britannia Spoons, case lots.....60&5% cash

Springs—

Door.—

Torrey's Rod, regular size....₩ doz $1.80
Gray's, ₩ gr., $20.00.....20%
Bee Rod ₩ gr., $20.00.....20%
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Cowell's....No. 1, ₩ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₩ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25&30@35%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10&10%
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron, Nickel-Plated.....80&10@80&10&10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's.....₩ doz $2.00
Blair's "Climax".....₩ doz $1.25

Lemon—

Porcelain Lined, No. 1....₩ doz $6.00, 25&20%
Wood, No. 2.....₩ doz $3.00, 25%
Wood, Common.....₩ doz $1.70@1.75
Dunlap's Improved.....₩ doz $3.75, 30%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz.....25&10%
Jennings' Star.....₩ doz $2.50
The Boss.....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50&50&5%
King.....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass.....₩ gro. $9.00
Manny Lemon Juice Extractor:
Standard.....₩ doz $0.75@$1 00
Improved.....₩ doz $4.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger.....₩ ℔ 7@7½¢
Barbed, ¼ in. .....₩ ℔ 8@8½¢
Fence Staples, Galvanized, Fence Staples, Plain..... Same price as B'rb Wire See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods.....40@4 &10%
Butterfield's Goods.....40@40&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30 %
Gardner.....25%

Stops, Bench.

Morrill's.....₩ doz $9, 50%
Hotchkiss's.....₩ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₩ doz $5.....10%
Cincinnati.....25&10%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₩ ℔ 2½¢
Washita Stone, Extra.....₩ ℔ 23@25¢
Washita Stone, No. 1.....₩ ℔ 19@20¢
Washita Stone, No. 2.....₩ ℔ 12@13¢
Washita Slips, No. 1, Extra..₩ ℔ 44@46¢
Washita Slips, No. 1.....₩ ℔ 33@35¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₩ ℔ 40¢
Turkey Slips.....₩ ℔ $1.00@1.50
Lake Superior, Chase.....₩ ℔ 13¢
Lake Superior Slips, Chase.....₩ ℔ 20¢
Seneca Stone, Red Paper Brand....₩ ℔ 18@20¢
Seneca Stone, High Rounds..₩ ℔ 20@25¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished.....₩ doz $2.25
Cast Iron, Steel Points.....₩ doz 80¢
Socket.....₩ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " ....₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89 $5.00
Electric.....List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ doz $20, 50@50&5%
Perry .....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Sweepers, Carpet.

Bissell No. 5.....₩ doz $17.00
Bissell No. 7 New Drop Pan.₩ doz $19.00
Bissell, Grand.....₩ doz $36.00
Grand Rapids.....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ doz $15.00
Jewel.....₩ doz $17.00
Improved Parlor Queen, Nickeled.....₩ doz $27.00
Japanned.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Queen.....₩ doz $16.00
Queen, with band.....₩ doz $18.00
King.....₩ doz $30.00
Weed, Improved.....₩ doz $18.00
Hub.....₩ doz $16.00
Cog-Wheel.....₩ doz $16.00
Easy.....₩ doz $22.00
Monarch.....₩ doz $32.00
Goshen.....₩ doz $21.00
Ladies' Friend.....₩ doz $15.00
Advance.....₩ doz $18.00
Supreme.....₩ doz $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard Weights Short Weight goods are sold at lower prices.

Carpet Tacks—

American, Blued	75 %
American, Tin'd and Cop'd	77½ %
Steel, Bright and Blued	72½ %
Steel, Tinned and Coppered	75 %
Swedes Iron, Blued	72½ %
Swedes Iron, Tinned	75 %
American Iron Tacks	72½ %

Swedes Iron Tacks—

S. S., Blued	75 %
S. S., Tinned	77½ %
Lanc., Blued	66⅔ %
Lanc., Tinned	72½ %

Gimp and Lace Tacks—

S. S., Blued	75 %
S. S., Tinned	77½ %
Lanc., Blued	66⅔ %
Lanc., Tinned	72½ %

Basket and Trimmers' Tacks—

Lanc	65 %
S. S.	70 %
Hungarian Nails	66⅔ %
Miners' Tacks, S. S.	75 %
Miners' Tacks, Lanc	70 %
Common and Patent Brads	66⅔ %
Leathered Tacks	50 %
Brush Tacks	50 %
Looking Glass Tacks	50 %
Picture-Frame Points	50 %
Finishing Nails	66⅔ %

Trunk and Clout Nails—

Black	65 %
Tinned or Coppered	66⅔ %
Basket Nails	62½ %
Chair Nails	62½ %
Cigar-Box Nails	50 %
Tin Capped Nails	50 %

Regular discount 10&2 %, cash. On many of these goods extra 10@10&10 % is often given.

Miscellaneous—

D'ble-Point, 120 count 85&10@85&10&10%
Wire Carpet Nails.....60&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

In Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears Tinners', &c.

Tinware—
Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&25%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....20%
Barton's.....30@30&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%
Lumber.
Bing Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $13.00
Saw.
Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering.....20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's' Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	25¢	31¢
No. 12, ¼ and ½ ℔ Balls	22¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	29¢
No. 24, ¼ and ½ ℔ Balls	20¢	29¢
No. 36, ¼ and ½ ℔ Balls	18¢	28¢
No. 264, Mattress, ¼ and ½ ℔ Balls	53@54¢	
Chalk Line, Cotton, ½ ℔ Balls	25¢	
Mason Line, Linen, ½ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)	15½¢	
3-Ply Hemp, 1 ℔ Balls	16¢@16½¢	
3-Ply Hemp, 1¼ ℔ Balls	15¢@15½¢	
Cotton Wrapping, 5 Balls to ℔	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls	10¢	
Wool	6½¢@8½¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....30@35%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@30%
Sargent's.....60&10&5%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....30@35%
Simpson's Adjustable.....40%
Moore's.....30%
Massey Quick Action.....30 @ 25 %
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....30&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....30%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.& W.R.A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R.A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....	$1.70@$1.75
Eley's P. E., 11@10.....	3.00@ 3.25

Dis. 20&2½

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70&10@70&10&5%
Boilers and Saucepans.....50&10@60%
Tinned Boilers and S'pans....50&10@60%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		5.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.
Indurated Fiber—25%
Spittoons, No. 2, ₩ doz.....$3.40
Basins, Ringed, ₩ doz., No. 2.....$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.90
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$1.60
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother, Hartford Silver Plate Co., William Rogers Mfg. Co..... 40&5%

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1¾
Washers.....	6	5	3.50¢	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $13@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.25; 10 in., $2.70; 12 in., $3.2

Wire and Wire Goods—
Iron—
Market.
Br. & Ann., Nos. 0 to 13.....77½%
Cop'd, Nos. 0 to 13.....75%
Galv., Nos. 0 to 13.....67½%
Tin'd, Tinned list Nos. 0 to 13.....67½%
Stone,
Br. and Ann'd, Nos. 16 to 18....77½%
Bright and Ann'd, Nos. 19 to 26.....80%
Br. and Ann'd, Nos. 27 to 36.....82½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔.....5¢
Galvanized Fence, Nos. 8 and 9.....70%
Brass, list Jan. 18, 1884.....35%
Copper, list Jan. 18, 1884.....35%
Annealed Wire on Spools.....50%
Malin's Steel and Tin'd on Spools.....55%
Malin's Brass and Cop. on Spools.....45%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $. 30%
Steel Music Wire, 13 to 20...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.
Bright Wire Goods—
Standard list.....80&10%
Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire, Barb.—F.o.b. Cars. Dis. 5% cash in 10 days.

	Painted.	Galvanized.
Pittsburgh and Cleveland.	$2.55	$3.05
Allentown, Cincinnati and Joliet	2.65	3.15
St. Louis	2.70	3.20
Keokuk	2.75	3.25
Lockport, Baker Perfect..	2.85	3.35
Lawrence and Omaha....	2.90	3.40
San Francisco	3.80	4.30

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics".....50&10&2%
Girard Standard.....55&10%
Lamson & Sessions' Engineers'..50&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural..... 75&10@75
Girard Agricultural..... 10&5%
Lamson & Sessions' Agric'l..
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....35%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....50&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....35&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, '91, 2% cash
Colby Wringer Co., list Sept. 1, '91, 2% cash

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 85@85&10

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal.	37	@	..
Linseed, City, boiled	40	@	..
Linseed, Western, raw	35	@	36
Lard, City, Extra Winter	56	@	..
Lard, City, Prime	53	@	54
Lard, City, Extra No. 1	42½@		45
Lard, City, No. 1	37½@		40
Lard, Western, prime	53	@	..
Cotton-seed, Crude, prime	27	@	28
Cotton-seed, Crude, off grades	25	@	26
Cotton-seed, Summer Yellow, prime	32	@	33
Cotton-seed, Summer Yellow, off grades	29	@	31
Sperm, Crude	..	@	70
Sperm, Natural Spring	..	@	..
Sperm, Bleached Spring	..	@	..
Sperm, Natural Winter	73	@	75
Sperm, Bleached Winter	78	@	80
Whale, Crude	..	@	45
Whale, Natural Winter	54	@	56
Whale, Bleached Winter	56	@	58
Whale, Extra Bleached	58	@	60
Sea Elephant, Bleached Winter	63	@	64
Menhaden, Crude, Sound	..	@	30
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed	34	@	35
Menhaden, Bleached W'ter	36	@	37
Menhaden, Extra Bleached	38	@	39
Tallow, City, prime	..	@	43
Tallow, Western, prime	..	@	..
Cocoanut, Ceylon	6	@	6¼
Cocoanut, Cochin	7	@	7¼
Cod, Domestic	34	@	36
Cod, Foreign	..	@	..
Red Elaine	38	@	39
Red Saponified	₩ ℔ 5	@	6¼
Sank	per gal ..	@	33
Straits	..	@	34
Olive, Italian, bbls	62	@	65
Neatsfoot, prime	55	@	65
Palm, prime, Lagos	₩ ℔ 6	@	1¼

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test	per gal	7½@	8
Black, 29 gravity, 15 cold test		8½@	9
Black, 29 gravity, summer		6½@	7
Cylinder light, filtered	15	@	20
Cylinder, dark, filtered	13	@	15
Cylinder, dard, st'm refined	10	@	13
Paraffine, 23½ @ 24 gravity	13½@		14
Paraffine, 25 gravity	12½@		13
Paraffine, 28 gravity	9½@		10
Paraffine, red, 21 @ 22 gr'ty	..	@	..
Paraffine, red, 22½@23 gr'ty	13	@	14

Paints and Colors.

Barytes, Foreign, ₩ ton	$22.00	@	24.00
Barytes, Amer. floated	30.00	@	32.00
Barytes, Amer. No. 1	19.00	@	20.00
Barytes, Amer. No. 2	13.00	@	16.00
Barytes, Amer., No. 3	11.00	@	12.00
Blue, Celestial	₩ ℔ 6	@	8
Blue, Chinese	50	@	55
Blue Prussian	25	@	40
Blue, Ultramarine	3	@	25
Brown, Spanish	½@		1
Brown, Vandyke, Amer.	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk	3.10	@	..
Carmine, No. 40, in boxes or barrels	3.20	@	..
Carmine, No. 40, in ounce bottles	4.20	@	..
Chalk, in bulk	₩ ton.	@	1.95
Chalk, in bbls.	₩ 100 ℔. 33	@	40
China Clay, English	₩ ton. 13.00	@	16.00
Cobalt Oxide, prep'd	2.00	@	....
Cobalt Oxide, black	lots 100℔ 2.60	@	....
Cobalt, Oxide, black	less 100℔ 2.65	@	....
Green, Paris, in bulk	14	@	15½
Green Paris, 170 @ 175 ℔ kegs	14½@		15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	8	@	11
Green, Chrome, pure	22	@	25
Lead, Eng., B.B. white	8½@		10
Lead, Amn. White, dry or in oil:			
Kegs, lots less than 500 ℔		@	7¼
Kegs, lots 500 ℔ to 5 tons		@	7
Kegs, lots 5 tons to 13 tons		@	6¾
Kegs, lots 13 tons and over		@	6½
Lead White in oil 25 ℔ tin pails add to keg price		@	⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		@	¼
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2¼
Lead, Red, bbls. and ⅛ bbls	6¾	@	7½
Lead, Red, kegs	6¾	@	7½
Litharge, kegs	6¾	@	7½
Litharge, bbls. and ⅛ bbls	6¾	@	7¼

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35	@	1¼
Ocher, French Washed	1½@		2¼
Ocher, German Washed	1½@		3
Ocher, American	½@		1½
Orange Mineral, English	9	@	9½
Orange Mineral, French	10	@	10¼
Orange Mineral, German	9½@		10
Orange Mineral, American	8	@	8¼
Paris White, English Cliffstone	1.00	@	1.15
Paris White, American	70	@	75
Red, Indian, English	5½@		7
Red, Indian, American	2	@	6½
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American ₩ 100 ℔.	1.00	@	1.25
Red, Venetian, English	1.00	@	1.50
Sienna, Italian, Burnt and Powd. ₩ ℔	5	@	6¾
Sienna, Ital., Burnt Lumps	1½@		2¼
Sienna, Ital., Raw, Powd	5	@	6¾
Sienna, Ital., Raw Lumps	2	@	2¾
Sienna, American, Raw	1½@		1¾
Sienna, American, Burnt and Powdered	1½@		1¾
Talc, French	1¾@		1¾
Talc, American	1	@	1¾
Terra Alba, Fr'ch. ₩ 100 ℔	90	@	1.00
Terra Alba, English	50	@	60
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	40	@	50
Umber, Turkey, Bnt. and Powd. ₩ ℔	3½@		4
Umber, Turkey Bnt. in	2½@		3
Umber, Turkey, Raw and Powdered	3½@		..
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome	10	@	25
Vermilion Americ. Lead	11½@		17
Vermilion, Quicks'er, bulk	64	@	66
Vermilion, Quicks'er, bags	65	@	67
Vermilion Quicksilver, smaller pkgs	69	@	71
Vermilion English Import	80	@	85
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste	87½@		90
Vermilion, Chinese	90	@	95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'	50	@	55
Zinc, American, dry	₩ ℔ 4½@		5
Zinc, French, Red Seal	..	@	3½
Zinc, French, Green Seal	..	@	3½
Zinc, French, V. M. X	..	@	7
Zinc, Antwerp, Red Seal	..	@	7½
Zinc, Antwerp, Green Seal	..	@	3½
Zinc, German, L. Z. O	..	@	6½
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over	10½@		11¼
lots less than 1 ton	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal,	..	@	..
lots of 1 ton and over	10	@	10¼
Lots of less than 1 ton	10½@		10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese	₩ ℔ 35	@	40
Blue, Prussian	20	@	45
Blue, Ultramarine	12	@	18
Brown, Vandyke	7	@	12
Green, Chrome	8	@	13
Green, Paris	16	@	18½
Sienna, Raw	7	@	14
Sienna, Burnt	7	@	14
Umber Raw	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ⅛ bbls	1.35	@	1.45
In tubs	.01½	@	.01¾
In tin cans	.01½	@	.02¼
In bladders	.01½	@	.02¼

Spirits Turpentine.

In regular bbls	36½@		..
In machine bbls	37½@		..

Glue.

Low Grade	₩ ℔ 8	@	10
Cabinet	12	@	14
Medium White	13	@	15
Extra White	17	@	20
French	10	@	22
English	10	@	15
Irish	12	@	..

CURRENT METAL PRICES.

OCTOBER 28, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square.. 1 to 6 in. x ⅝ to 1 in....	₩ lb 1.90 @ 2.00¢
Refined Iron:	
¾ to 2 in. round and square. 1 to 4 in. x ⅝ to 1½ in.... 4½ to 6 in. x ⅝ to 1 in.	₩ lb 2.00 @ 2.20¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.40¢
Rods—¾ and 11-16 round and sq.	₩ lb 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.00 @ 2.50¢
"Burden Best" Iron, base price.	₩ lb.... 3.00¢
Burden's "H. B. & S." Iron, base price	₩ lb.... 2.80¢
"Ulster"	₩ lb.... 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16	₩ lb 3.00 @ 3.00¢	3.35 @	¢
17 to 20	₩ lb 3.15 @ 3.25¢	3.35 @ 3.75	¢
21 to 24	₩ lb 3.35 @ 3.35¢	3.60 @	¢
25 and 26	₩ lb 3.35 @	3.60 @	¢
27	₩ lb 3 50 @ 3.62½¢	3.85 @	¢
28	₩ lb 3.65 @	4.10 @	¢
	B. B.	2d qual.	
Galv'd, 14 to 20,	₩ lb, 4.75 @	4.60 @	¢
Galv'd, 21 to 24,	₩ lb, 5.12 @	5 00 @	¢
Galv'd, 25 to 26,	₩ lb, 5.50 @	5.35 @	¢
Galv'd, 27	₩ lb, 5.90 @	5.70 @	¢
Galv'd, 28	₩ lb, 6.25 @	6.10 @	¢
Patent Planished	₩ lb A 10¢	B, 9¢	
Russia	₩ lb 10½¢ @ 11¢		
American Cold Rolled R. B.	₩ lb 5¢ @ 7¢		
Craig Polished Sheet Steel	₩ lb, 8½¢		

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged. Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs	22½¢
Straits, Pigs	22 ¢
Straits in Bars	24 ¢

Tin Plates.

Charcoal Plates.—Bright.

					Per box.
Melyn Grade	IC,	10	x 14	@	$6.75
" "	IC,	12	x 12	@	7.00
" "	IC,	14	x 20	@	6.75
" "	IC,	20	x 28	@	13.70
" "	IX,	10	x 14	@	8.25
" "	IX,	12	x 12	@	8.50
" "	IX,	14	x 20	@	8.25
" "	IX,	20	x 28	@	16.50
" "	DC,	12½	x 17	@	6.25
" "	DX,	12½	x 17	@	7.75
Calland Grade	IC,	10	x 14	@	6.70
" "	IC,	12	x 12	@	6 95
" "	IC,	14	x 20	@	6.60
" "	IX,	10	x 14	@	7.85
" "	IX,	12	x 12	@	8.20
" "	IX,	14	x 20	@	7.85
Allaway Grade	IC,	10	x 14	@	6.35
" "	IC,	12	x 12	@	6.50
" "	IC,	14	x 20	@	6.35
" "	IC,	20	x 28	@	12.40
" "	IX,	10	x 14	@	7.50
" "	IX,	12	x 12	@	7.80
" "	IX,	14	x 20	@	7.50
" "	IX,	20	x 28	@	15.00
" "	DC,	12½	x 17	@	6.80
" "	DX,	12½	x 17	6.00 @	7.00

Coke Plates.—Bright.

Steel Coke.	IC,	10 x 14,	14 x 20	@	$5.70
		10 x 20		@	8.10
		20 x 28		@	11 70
	IX,	10 x 14,	14 x 20	@	6.60
BV Grade.	IC,	10 x 14,	14 x 20	@	5.70

Charcoal Plates.—Terne.

Dean Grade.	IC,	14 x 20		@	$5.60
		20 x 28		@	10.75
	IX,	14 x 20		@	6.80
		20 x 28		@	12.50
Abecarne Grade.	IC,	14 x 20		@	5.40
		20 x 28		@	10.75
	IX	14 x 20		@	6.35
		20 x 28		@	12.35

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	@ $13.50
IXX, 14 x 28	112 sheets	@ 13.75
IXX, 14 x 31	112 sheets	@ 15.25

Copper.

DUTY: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 13¼¢
Ansonia Grade Arizona	@ 13 ¢
Ansonia Grade Casting	@ 12¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 40 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	64 oz. to 32 oz.	32 oz. to 16 oz.	16 oz. to 14 oz.	14 oz. to 12 oz.	12 oz. to 10 oz.	10 oz. to 8 oz.	Less than 8 oz.
30	72		23	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	..	..	....	....
84	96		23	24	....	....	..	..	....	....
84		96	24	25	....	....	..	..	....	....
Over 84 in. wide			25	27	....	....	..	..	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.27	0.29	0 31	0.35

Bolt Copper, ⅝ inch diameter and over, per pound 22¢

Circles, 60 inches in diameter and less, 2 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

— % discount.

Tinning.

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ lb
14 oz.	25¢ ₩ lb
12 oz.	27¢ ₩ lb

Seamless Brass and Copper Tubes.

Net.

Sept. 16, 1891.

O. G.	N. G.	⅛	¼	⅜	½	¾	1	1¼
6-14	6-13	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	28	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	43	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	39	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	38¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	65¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	30 @ ..5

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 10	in. 10 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 26	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.75

Discount from List 25 %.

Brass and Copper Wire.

Old English guage standard.	Com. high brass. Per lb.	Low brass. Per lb.	Gildi'g br'se & copper Per lb
All Nos. to No. 16, inclusive	$0.22	$0 26	$0.30
No. 17 and No. 18	.23	.27	.31
No. 19 " " 20	.24	.28	.32
No. 21	.25	.29	.33
No. 22	.26	.30	.34
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.58
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.78	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

	Per lb.		Per lb.
No. 5	49¢	No. 11	56¢
No. 6	49¢	No. 12	58¢
No. 7	49¢	No. 13	60¢
No. 8	50¢	No. 14	65¢
No. 9	52¢	No. 15	70¢
No. 10	54¢		

— % discount.

Tobin Bronze—Rods.

¼ inch and larger 17¢ ₩ lb, net

Tobin Bronze—Piston Rods.

1¼ inch and smaller 18¢ ₩ lb, net
Over 1¼ inch 20¢ ₩ lb, net

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¢
Bertha (pure)	8¼¢ @ 9 ¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	7¼¢
Per lb	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American	4¾¢
Bar	5¼¢
Pipe, subject to trade discount	¢
Tin-Lined Pipe, subject to trade discount	15%
Block Tin Pipes, subject to trade discount	37½¢
Sheet, subject to trade discount	7¾¢

Solder.

½ @ ½ (Guaranteed)	14¢
No. 1	13¢
Extra Wiping	11½¢ @ 15¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 14½ @ 15 ¢
Hallett's	" @ 12 ¢

ALUMINUM.

Prices in Ingots.

In lots of 2000 lb and over ₩ lb .50¢

Old Metals.

(Prices Paid in New York.

Heavy Copper	₩ lb 10 ¢
Light Copper	₩ lb 9 ¢
Heavy Brass	₩ lb 7 ¢
Light Brass	₩ lb 6 ¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14 ¢
No. 2 Pewter	₩ lb 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.00